

AMERICAN FRUIT GROWER

Vol. XXXIX
No. 3

March 1919

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A Copy



Edited by Samuel Adams

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In spite of the need there was little enthusiasm for good roads when the Board of County Commissioners met. Everyone was afraid of the presumed high cost and increased taxes.

A farmer in the back of the room arose.

"Mr. Chairman," he said, "I ain't fit to address a dignified meeting like this, but that's because I've had to travel for ten miles over the kind of roads you give us.

"I couldn't drive, I had to ride horseback.

"My boots are covered with mud;

my trousers are covered with mud; my coat is covered with mud; my hat is covered with mud; and if I hadn't stopped to wash it my face would be covered with mud, too.

"I look as if I had crawled here on my hands and knees, and I'm only half through because I've still got to go back, with five dollars worth of groceries that I bought from brother Fletcher.

"If there had been a good, hard road that my old horse could climb up and draw in a load of lumber that I've got ready, I would have bought twenty-five dollars' worth of groceries instead of five dollars' worth, and there would have been that much more money in town tonight."

And the mud-covered farmer sat down!

Other speakers took up his case. They pointed out that good roads were an *asset* instead of a *liability*; an *economy* instead of an *expense*; that

they brought money into a town and greatly increased the markets.

The result was that the Commissioners enthusiastically passed a resolution to issue bonds enough to give them several miles of good roads.

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Planting and Growing Dwarf Fruit Trees

By U. P. Hedrick, New York

DWARF trees are plants which by various means are made to grow smaller than normal specimens of the same variety. In this instance the word "dwarf" does not carry with it an implication of unhealthiness or of weakened vitality. Animals and plants are so often dwarfed through disease or through lack of vitality that dwarfs are associated with lack of health; but a dwarf tree may be as healthy and may have as much vitality as a normal tree.

Fruit trees are dwarfed in several ways; as, by growing on stocks which dwarf the top, by restricting the root-run and by pruning to check or suppress the top. Dwarf trees, in the fruit grower's acceptance of the term, however, are those which are grown on dwarfing stocks. Here, it may be remarked, that tree-like forms usually succeed very well on bushes or smaller growing plants of the same species, or of closely related species. The cases are few, however, where varieties or species or small stature can be profitably grafted on plants of larger size. Unfortunately, there are no known relationships of plants which serve as guides in the matter of grafting. The affinities of stocks and scions are determined only by trial.

When dwarfing is produced by grafting on another stock, the tree takes on the size, and to some extent, the habit of the plant upon which it is grafted. Thus, the pear on quince takes the size of the quince tree; an apple on the bush-like Paradise takes the size of this miniature apple tree; on the half-dwarf Doucin, an apple variety of normal size takes the form and habit of the Doucin.

Dwarf Apples

Of the several dwarfing stocks for apples but two, French Paradise and the Doucin, are in common use. French Paradise is the dwarfest of the several stocks and has the reputation of being the most precocious in bearing as it is also in season of blooming and fruiting. The root system of this stock is small, fibrous, very close to the surface and takes hold of the soil

so slightly that trees several years of age can easily be pulled by hand from the ground. The stocks may be propagated from cuttings but are more commonly grown from mound layers. There are several strains of French Paradise of which the best known are Pigmy and Miniature. The Doucin is a French stock which

America, at least in name, for here all half-dwarfing stocks, as English Paradise and Broad-leaved Paradise, go as Doucin.

Dwarf Pears

Pears are dwarfed by propagating them on quince roots. Long experience has taught that the Angers quince, named

year the variety with the antipathy to the quince is budded on the pear top.

Dwarf Peaches, Cherries and Plums

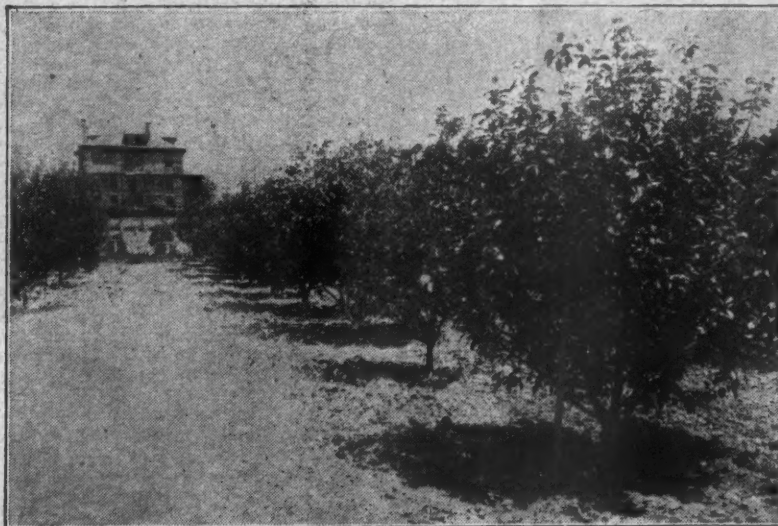
Success so seldom follows that it is hardly worth while discussing the dwarfing of stone fruits. Indeed, the so-called dwarfs of these fruits are seldom dwarfs—they but take on a slightly smaller size than standard trees on certain stocks. Thus, the peach is usually dwarfed more or less by budding it on any of several plum roots or the dwarf sand cherry. The plum is said to be dwarfed more or less by working it on Myrobalan stock, but in the writer's experience such dwarfing is seldom perceptible. The plum may be dwarfed considerably, however, by budding it on sand cherry, as may also such cherries as can be worked on this stock.

Advantages of Dwarf Fruit Trees

The obvious advantage of the dwarf tree is its small size whereby more trees and more varieties of fruits may be planted in a small space. Dwarf trees, then, fulfill in particular the needs of amateur fruit growers who want several kinds of fruit or several varieties of any one fruit. To a lesser extent they supply the needs of commercial fruit growers who want small-growing fillers to set in permanent orchards.

Another very material advantage of most of the dwarf fruits is that they come in bearing earlier than standards. This is an obvious advantage, proving valuable in many ways. Early bearing encourages the planting of trees since elderly people may plant and expect to see their trees come into fruit and often the renter who expects to stay but a decade or even less in a place may plant with the expectation of seeing something ripen. Early bearing is also an advantage when one is testing varieties.

Advocates of dwarf fruits assert that the fruit from the dwarf tree is of higher quality, being brighter in color and better in flavor. As a generalization this is probably not true, though it usually proves true



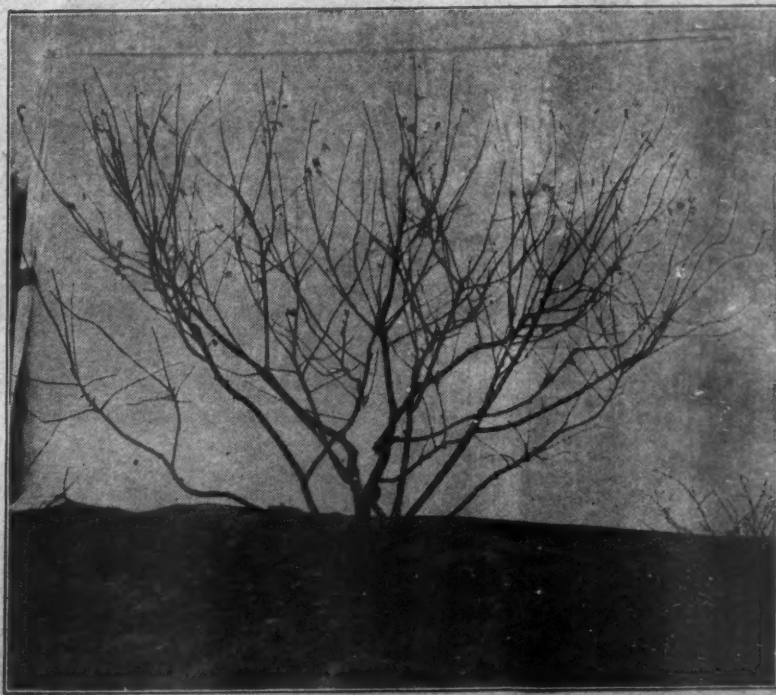
Dwarf Apples—Doucin Stock—Well Grown Trees

roots and grows much more freely than French Paradise, the root-system differing greatly in having many more woody roots which strike downward to a greater depth. Many growers claim that there is little or no difference between this and the strong-growing Broad-leaved English Paradise. This is the chief dwarfing stock used in

after Angers, France, from which dwarf pear stocks are commonly imported, is better than any other quince. Some pears, however, do not make good unions with the quince. This difficulty is met by "double-working." That is, a pear which succeeds on the quince is first budded on the dwarfing stock and after it is grown a



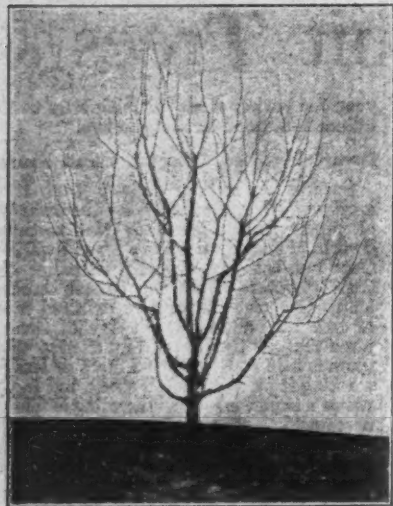
Dwarf Apple, Unpruned



Dwarf Apple, Pruned

for a very few varieties of apples and pears. Size, color and quality of fruit are as likely to be effected deleteriously as beneficially by dwarfing the trees. He who plants dwarf fruits, then, must carefully select his varieties.

Advocates of dwarf trees make much of the fact that trees of smaller size are easier to prune and spray and that the crop is harvested with less trouble. This saving in labor is more than offset, as a rule, by the fact that dwarf trees need more pruning and must have considerable attention to prevent the tops from putting out water sprouts and the roots from throwing up suckers. As a rule, also, it is rather more difficult to cultivate the low-headed dwarfs than the higher standards. It is necessary,



The Dwarf Bartlett, Unpruned

year in and year out, also, to dig around dwarf trees to see that the cions are not taking root.

Disadvantages of Dwarf Fruit Trees

There are several rather marked disadvantages of dwarf fruits that offset or more than offset the advantages for commercial orchards at least. These may be summed up as follows: Dwarf trees are shorter lived than standards, there being but few exceptions to this rule. Dwarf trees need more care than standard trees. The chief items needing extra care are pruning, tilling and fertilizing. It is often difficult or impossible to secure varieties that are wanted in dwarfing stocks in which either top or bottom are known to be true to name. It is much more difficult to propagate dwarf trees so that the cost of the plants is greater, making the cost of an acre or an orchard, with the increased number of trees, very much greater.

Care of Dwarf Trees

Dwarf orchards should receive essentially the same care given standard orchards except in the few particulars now to be named. It is necessary to go over dwarf orchards each spring and cut such roots as spring from the cion and such suckers as come from the stocks. Shallow planting obviates rooting from the cion but this proves disastrous under cultivation as the shallow planted trees blow over even in moderate winds.

Pruning the dwarfs is more difficult than pruning standard trees. The winter pruning is much the same as for standard trees except that it is necessary to head back the dwarf more severely and shape the head a little more carefully. To secure true dwarf trees, summer pruning to supplement the winter pruning is absolutely necessary. This summer pruning is the most difficult and the least satisfactory operation in growing dwarf fruits in America. Its object is to check the growth and to better form the head of the tree. The time for summer pruning is dependent on the season. Pruning too early in the summer is usually followed with weak, spindling, second growths which do not mature and succumb to the cold of the next winter. If the pruning is done too late the object sought is not attained. The writer's experience, covering a good many years, is that the best time to prune in the summer is immediately after the season's growth is attained, usually, in New York at least, in late July or early August.

Distances to Set Dwarf Trees

The dwarfing effects of dwarf stocks in America are often disappointing. There is not nearly the difference in size between

dwarf and standard trees to be found in European orchards. We fail somewhat in growing true dwarfs in America because of a climate unsuitable to dwarfing trees and possibly because we do not have the skill or cannot take the time to prune properly. For these reasons, too, dwarf fruits in America must have more room than European writers recommend for them. Thus, apples on Paradise stock should be planted from 12 to 15 feet apart; on Doucin stocks, 15 to 18 feet apart; dwarf pears should be set at least a rod apart. Unless roots springing from the cion are removed annually, it will be found that these distances are not great enough, the dwarfs taking on more and more the size of the standards as roots from the top are permitted to grow.

Varieties of Dwarf Fruit Trees

The New York Agricultural Experiment Station carried on three ten-year experiments in different parts of New York with dwarf apples, using 40 varieties in the tests. The varieties did not do equally well in the three orchards. In selecting sorts the question of longevity must be taken into account; the use for which the apple is wanted is a factor; and the age at which the trees come in bearing must be considered. Without discussing these several factors in detail the writer can only express his judgment as to the varieties most suited for dwarf apples for the country at large. There is little question but that McIntosh should be placed at the head of the list, followed by Wealthy, Lady, Jonathan, Spitzenburg, Grimes, Alexander, Boiken and Bismarck. Out of the 40 kinds tried in the three tests mentioned these are the only ones to be recommended for dwarf trees.

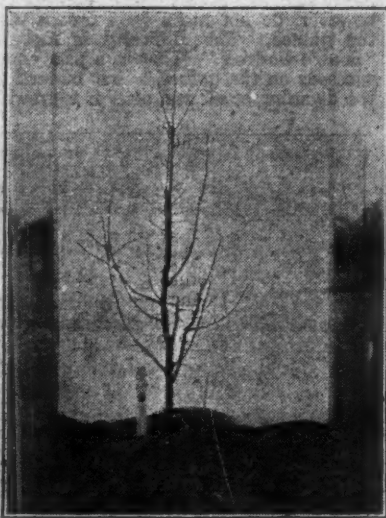
It is easier to specify varieties of dwarf pears. The following are the only sorts worth trying as dwarfs: Angouleme, Louise Bonne, Anjou, Bosc and Bartlett. Bosc, out of these five, should be double-worked.

The Place for Dwarf Fruit Trees

Dwarf fruit trees are of little value in America to commercial fruit growers. The place for these trees is in the gardens of amateurs and on the estates of those who can afford to grow and train them for their beauty as well as for their fruit. In these situations they are most valuable. It is possible that when the care of dwarf trees is better understood there may be a future for them as fillers in commercial plantations but this time seems not as yet to have arrived.

Special Forms for Dwarf Fruit Trees

Dwarf trees may be trained into pyramidal or vase form; into fan or V-shaped shapes; with a single, upright or horizontal



A Three-year-old Dwarf Bartlett, Pruned

stem; and into various modifications of these forms. These elaborately trained trees as yet have small place in American horticulture but in some parts of the world they are much in vogue in the plantations of commercial fruit growers as well as the gardens of wealthy amateurs. Large size, handsomely colored and well-flavored fruits repay the trouble of training.

To describe the formation of the many special forms would require a volume and no small one. The underlying principles, however, are simple. Fruiting branches are allowed to grow only at certain points on the trees, and fruit-spurs are made to

grow in regular succession. This disposition of branches into precise forms, difficult as it seems when one looks at the finished tree, is comparatively easily and quickly accomplished. These special forms, besides furnishing the best of fruits, are most suitable for adorning arbors, trellises, pergolas and for covering walls and fences. Pears and apples are best suited for these special forms but peaches, plums and cherries are easily managed in the simpler forms.

ASPHALTUM FOR BORERS

Editor AMERICAN FRUIT GROWER:

I inclose a communication from Prof. Howard, of the University of California, and another from M. B. Waite, of the United States Department of Agriculture, both due to your article in the AMERICAN FRUIT GROWER some months since. I wish you would publish these letters and continue the discussion and investigation.

From my experience I am inclined to prefer asphaltum with a little creosote added, for a protection for apple and peach trees both against the borer and rabbit as well as the best dressing for cuts. You ought to put the proper article on the market and publish the formula.

S. W. MORRISON, Pennsylvania.

DR. S. W. MORRISON, Embreeville, Pa.

DEAR SIR—While I am not posted on the different grades of asphaltum I may say that the so-called grade D is handled by construction companies and sometimes by lumber dealers in this state. This grade of asphaltum has a 75-degree penetration and is known as the District of Columbia standard 99.9 per cent bitumen. It contains practically no distillate. What is known as the flux or liquid bitumen is a very soft asphalt which is of no use for tree purposes.

The last time we bought asphalt as a tree wash we specified grade D to the purchasing agent, but when the material came the name on the box designated it as S-Flotene. I have an idea the 99 per cent asphalt you have will be safe for using on fruit trees. In fact I think there is little danger from using any of the hard asphalts, but never having made a full investigation of the subject I am perhaps not competent to make positive statements of this kind.

Very truly yours,

W. L. HOWARD,

Associate Professor of Polomogy, Berkeley, Cal.

DR. S. W. MORRISON, Embreeville, Pa.

DEAR SIR—I note your question about the use of asphaltum for covering wounds produced by rabbits and for coating the stubs where the young trees have been cut off after rabbit injury. I regret to say that I have not had definite experience with the different grades of asphaltum. I have no doubt, however, that some of the asphalt washes could be used satisfactorily. In fact, you appear to be having success yourself with this.

On the other hand, for the past three or four years I have had excellent success with the coal tar creosote mixture on fruit trees, particularly apples and pears. Four years ago, not being satisfied with white lead paint for pruning wounds, pear blight eradication scars and canker scars, I tried out the tree paint widely used by the tree surgeons on shade and ornamental trees. This consists of $\frac{3}{4}$ or $\frac{1}{2}$ ordinary coal tar and $\frac{1}{2}$ to $\frac{1}{4}$ creosote oil. These are the ordinary materials sold under these names at the paint stores. The coal tar is rather thick though somewhat variable in density and just enough creosote oil should be stirred into it to make it into a thick paint. It is best handled by a stiff, worn old brush. A new brush with full length bristles may be used but it is rather too flexible.

We have had some slight injury to the margins of pruning wounds on peach with this material but not enough to keep us from using it and for three years I have used this method exclusively on 200 acres of fruit trees and have also seen its use on other orchards. This spring, having some rabbit scarred and rabbit girdled trees, I painted the scarred or not girdled trees with the coal tar creosote paint and cut off the girdled trees near the ground line and painted the stubs with this mixture. Some of the buds were a little slow in starting but most of these trees are now ten to twelve inches high and some which were slow in pushing out are now starting strongly. In other words, it has been a complete success.

I would make this suggestion, however, as a slight improvement on the procedure

American Fruit Grower

you are using. I have had experience with this rabbit girdling several times in past years. Instead of rubbing off all the buds but one, let everything grow that comes. Then when they are a foot to eighteen inches in height pinch the tip of all but the best one but still leave them on. The reasons for not disbudding the trees to one bud are two. The sprouts pushing from the buds of a rigid stub of a two and three year old tree are very tender and are easily knocked off when they are young. They are so top heavy that the wind is likely to blow them out. This is particularly the case when the whole strength of the tree is turned into one bud. By letting several buds grow but pinching them back, the strongest bud will still be strong and the root system will be strengthened by the great amount of foliage. The chances of retaining a good sprout are, of course, improved.

Next spring all the buds but one should be removed, if necessary, resawing the stub with a slanting cut so that it will heal readily, and repaint it. It may be necessary to dig the dirt away around the roots to do a good job of pruning. The sprouts selected for the tree may need heading back somewhat but from that time on should carry the growth satisfactorily. I have had these rabbit injured trees grow so strongly that after three years they could scarcely be distinguished from the rest of the orchard and in later years could not be told at all.

The success of the coal tar creosote mixture has been so pronounced with me that I have not taken the trouble to look for other preparations. It is both a disinfectant and a water-proof paint and can be renewed until the scar heals. I also use this mixture, though rather too late, in painting it onto the uninjured trees to prevent rabbits, and the block so treated was not touched though some work was done elsewhere by rabbits quite late in the spring.

Yours very truly,
M. B. WAITE, Pathologist in Charge,
United States Department of Agriculture, Washington, D. C.

CONTROL OF PEACH TREE BORER

By W. E. Rumsey, Entomologist, West Virginia Experiment Station

The peach tree borer is a serious menace to peach growing and an exceedingly difficult insect to control. The number of remedies and preventives tried against this pest is legion. But as yet no one has found a panacea for the trouble. Many have been recommended but after tests they have nearly all proved to be uncertain value.

In the work of the West Virginia Agricultural Experiment Station for the control of this insect two penetrating sprays, a miscible oil or an emulsion of aversin, carbolineum and soap, seem to be effective. The results obtained by these sprays are such that three commercial peach growers of the state have been using the miscible oil sprays for two years against this pest with encouraging results. While the experiment station does not want to make too great a claim for the miscible oil treatment it is, however, believed worthy of trial by the peach growers of West Virginia.

In the early fall the young peach borers, which have hatched during the summer, are just beneath the outer bark and, therefore, the latter part of September or the early part of October seem to be the proper time to apply the penetrating material.

The method used in applying this material: First, remove the soil from about the base of the peach tree as is done in "worming" and after the bark is dry, cut the trunk of the trees from the base of the cavity to six or eight inches above the general surface of the ground, using Secide or some other brand of miscible oil the proportion of one part to eight parts of water. A pressure of at least one hundred pounds should be maintained in making the application. After the spray material has penetrated the bark, replace the soil.

To determine whether or not the treatment is effective a block of trees must be left untreated with which to make a comparison when examining for results.

B. G. Pratt Co., 50 Church St., New York City, manufacturers of Secide, write us as follows: "If you missed the application and want to use 'Secide' this spring for borers, other experiments have shown that it should be used at 100 strength in the spring, or 1 to 4."

Small Fruits for the Home

By H. W. Richey, West Virginia University

THE SMALL fruit garden should be placed as conveniently as possible to the house. This location will necessarily limit the selection of the best adapted soil type. With the exception of gooseberries and currants, which prefer a rather heavy soil, small fruits do best in a moderately loose, friable loam, plentifully supplied with organic matter. In cases where the selection of such a soil is impossible, that chosen should be made to approach the desired condition as rapidly as possible by proper soil practices. It is essential that the land be in a cultivated crop the year before planting to small fruits, and that it be thoroughly prepared before planting in the spring.

Strawberries

Since strawberries are shallow-rooted plants and produce a heavy crop of fruit in a short time, they do best on fertile soils that have been thoroughly prepared. When ready to plant, the rows should be marked off 3½ feet apart. The distance of plants in the row will be determined chiefly by the system of training to be followed. If the hill system is used, in which case all runners are removed, the plants can be placed from 12 to 18 inches apart. Provided the hedge row is practiced, in which two to six runners from each original plant are spaced in and at the side of the row, 18 inches will be found a satisfactory distance. Both of these systems will allow the rows to be placed less than 3½ feet apart. Inasmuch as they necessitate considerable hand tillage, they are generally confined to home gardens.

The matted row is the system most generally practiced by commercial growers. In this system the plants should be placed about 2 feet apart in the rows, and runners permitted to set until they completely fill the row to a width of 18 inches. Some hand-hoeing will be necessary, and at such times it is advisable to thin out and space the runners so that the plants are about six inches apart in the matted row. In case runners are not restricted, they may set so thickly that the crop will be reduced in both quantity and quality.

In setting the plants, cut off about one-third of the root system, remove all but a couple of healthy young leaves, spread the roots well, and set so that the crown of the plant will be even with the surface of the soil, after setting, and, as in all other cases, compact the soil firmly about the roots.

In order to encourage the setting of strong vigorous runners which will be capable of producing a good crop the following season, it is advisable to remove the blossoms the first season. With the ever-bearers this practice should be discontinued about the first of July and a crop will be obtained that fall.

Thorough, shallow cultivation should be practiced regularly during the growing season. In order to prevent the destruction of desirable runners, the rows should always be cultivated in the same direction.

A mulch is essential to aid in preventing winter injury, to conserve moisture the following spring, and as a means of keeping the berries clean. Any material, such as straw, hay or leaves, that is free from weed seed, and will thoroughly cover the plants without compacting, will prove satisfactory. This mulch, which should be about two inches deep after settling, should be applied soon after the first severe freeze. After the frosty weather of spring is past, and before the plants show blanching, due to covering, the larger amount, and especially the coarser material, should be removed from the plants and placed between the rows. Provided a very heavy application has been made, some of the mulch may be removed from the plantation, but a sufficient quantity should be left upon the plants and between the rows to protect the berries from dirt.

In case it is desired to retain the bed for a second crop, the plantation can be rejuvenated. Mow the patch immediately after harvesting. In case there is not much mulch remaining, the ground is moist, and local conditions permit, the plantation should be burned over as soon as the cut foliage is sufficiently dry to permit a running fire. Such an operation assists materially in controlling insects and diseases.

The rows should now be narrowed to 3 or 12 inches. This can be done in numerous ways, such as plowing out the centers

of the rows, plowing out one-half of the row, or turning a furrow from each side of the row. Any method which will thin out the old plants and provide for sufficient new ones will be found satisfactory. After narrowing the rows the ground should then be harrowed smooth. By hand hoeing the remaining plants should then be thinned, if necessary, and spaced about 18 inches apart in the row. Regular and thorough cultivation should then follow, as during the first season. It is usually not advisable to take more than two crops from a plantation.

Due to the fact that the plantation should not be retained over two years, one is likely to have little difficulty in keeping injurious insects and diseases under control.

The white grub may cause serious injury, but can be effectively controlled by avoiding newly plowed sod land and by rotating crops.

The strawberry weevil occasionally causes heavy losses by destroying the fruiting stems. The damage can be considered

from the roots, they can be readily confined to the original plant. During the summer the terminal growths of the new canes should be pinched off when they have reached a height of about 24 inches in case of the blackcaps, and 30 inches in case of purple varieties. One should not allow the canes to grow tall and then cut them back to the desired height, as such a practice will reduce the yield of fruit. Pinching off the terminal growths causes the canes to become more stocky and to develop lateral branches from which the fruiting shoots will be produced the following season.

Immediately after harvesting the old canes should be cut out and burned, together with the new ones removed in thinning. The number of canes left to the plant will be determined by the vigor of the plant. Usually three to five sturdy, vigorous canes will be found sufficient. The lateral branches which have developed should not be pruned until early the following spring, when they should be headed back to 12 or 18 inches, depending upon

Although the blackberry suckers freely from the root, as does the red raspberry, the canes branch freely, so that the system of culture is, therefore, similar to that of the red raspberry, and the method of pruning similar to that of the blackcap. During the summer the tips of the growing canes should be pinched off when the canes have attained a height of about 2½ feet. This will promote the development of laterals and tend to produce a more stocky plant. Immediately after fruiting the old canes should be removed, the diseased and injured canes cut out, and the new canes thinned until they stand 12 to 18 inches apart in the row.

To assist in the control of insects and diseases, all canes removed should be burned.

The amount of heading in of the laterals the following spring depends somewhat upon the vigor of growth, but chiefly upon the fruiting habit of the variety. Some varieties bear fruit near the base of the laterals, while on others many of the base buds are sterile. It is necessary, therefore, that one observe the fruiting habit of the variety grown and prune accordingly.

The soil management for the blackberry is similar to that for the raspberry.

Under proper management the blackberry plantation should produce satisfactory crops for a period of about ten years.

Diseases and Insects

ANTHRACNOSE—Anthracnose is a disease which causes the development of brownish spots on the leaves and grayish-white sunken spots on the canes, giving the characteristic bird's eye appearance. This disease cannot be effectively controlled by spraying. The only remedy is to cut out and burn the diseased canes.

ORANGE RUST (Red Rust)—This disease is readily recognized by the orange coating that appears on the leaves. Spraying is ineffective. The diseased canes must be cut out and burned as soon as discovered in order to prevent the rapid spread of the disease.

CROWN GALL—This disease produces large growths on the roots at, or just below, the surface of the soil. The only means of control is to dig out and burn the diseased plants. Do not replant from a diseased patch or grow brambles on an infested field for three or four years after diseased plants have been removed.

Serious insect injury is rare, but when present the most reliable remedy is to prune out and destroy the injured canes.

Currants and Gooseberries

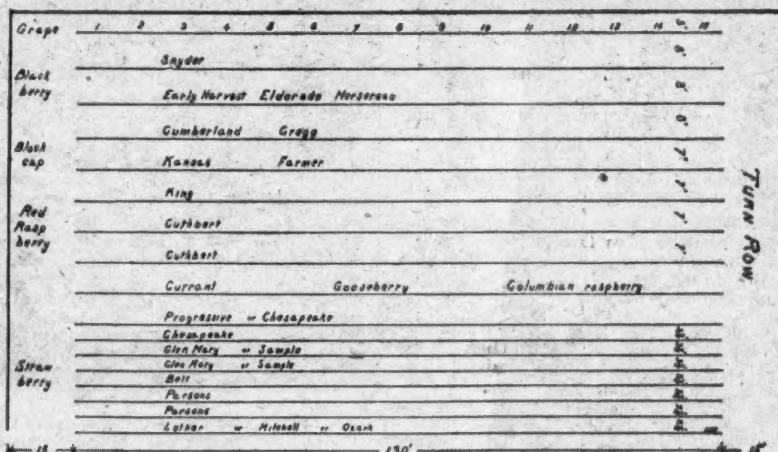
Currants and gooseberries can be planted satisfactorily in either fall or spring. As the plants start growth very early, spring planting should be as early as possible. The usual distance of planting is 4 feet apart and in rows 6 feet apart. In setting, the plants should be placed slightly deeper than they stood in the nursery and the soil packed firmly about the roots. The tops should be cut back about one-half.

Gooseberries and currants are heavy feeders, and as their roots do not spread far or penetrate deeply they thrive best on fertile soils in which the plant food materials are readily available. Liberal applications of barnyard manure prove advantageous. Thorough and shallow cultivation should be given frequently.

Since these plants produce most and the best of their fruit on one, two and three-year-old wood, it is not desirable to retain any wood more than three years old. All weak and surplus shoots should be removed, thus saving only sufficient new shoots to maintain the proper amount of fruiting wood. The number of shoots should be gradually increased as the bush becomes older until they total 10 to 12 of all ages. Each year only sufficient one-year-old shoots should be retained to replace the old ones removed. Any system of pruning that will produce an annual renewal of bearing wood in sufficient amounts to yield good crops will be found satisfactory. Pruning may be done any time during the dormant season, but preferably shortly before growth starts in the spring. By proper care the plants will produce satisfactory crops for ten or twelve years.

CURRENT WORM—The imported currant worm, which feeds upon the leaves and rapidly defoliates the bushes, is the most common and destructive insect of these fruits. This insect can readily be controlled by spraying the bushes thoroughly

SUGGESTIVE SMALL FRUIT GARDEN



Grapes: 1-2 Moore; 3-4 Worden; 5-6 Delaware; 7-9 Niagara; 10-12 Concord; 13-15 Catawba.
Currants: Red Cross, Perfection, Wilder. Gooseberries: Downing, Pearl, Industry.

ably lessened by planting profusely blossoming varieties, so that in case some blossoms are destroyed enough will remain to produce a good crop.

Raspberries

Raspberries are generally planted in rows 6 to 8 feet apart. For easy cultivation 7 or 8 feet is preferable, especially for the black and purple varieties and the more vigorous growing red varieties. As it would be impractical, in the small home garden, to cultivate in both directions, the hill system of culture will not be considered in this discussion. One is limited, therefore, to either the linear or the hedge system. The linear system is that in which only the plants originally set are permitted to develop. Inasmuch as the purple and black varieties do not form suckers from the roots, this linear system is suggested for such varieties. The hedge system is that in which new plants are permitted to set in and at the sides of the original row, thereby forming a solid row of plants. A narrow hedge system, in which only those suckers that come up in the row between the original plants are retained, is suggested for red raspberries. This will produce a row twelve to eighteen inches wide.

In both the linear and the hedge systems the plants should be set about three feet apart in the row. The purple varieties can be spaced from six inches to a foot apart. At the time of planting, cut back the tops to about six inches and set about two inches deeper than the plants grew formerly. While planting, care should be exercised to prevent the roots from drying by exposure to the air. It is advisable to plant as early in the spring as possible and while the buds are still dormant, so as to eliminate danger of breaking off the shoots and the resultant injury to the plant.

Although all the brambles send up canes one year which produce fruit and die the next, differences in habit of growth have necessitated different methods of pruning and systems of training. Inasmuch as the purple and black raspberries do not sucker

the vigor of growth and the fruiting characteristics of the variety. The laterals on the purple varieties can be left longer than those on the blackcaps.

The red raspberries sucker freely from the roots, and soon form a continuous row, which, as stated before, should be kept narrow. The new canes should not be cut back until the following spring. Cutting back during the growing season has a tendency to cause the development of more suckers, rather than causing the plants to develop lateral branches and become more stocky. The amount of heading back will depend primarily upon the length of growth, the taller ones being cut more severely than those of weaker growth. Some growers cut back very little or none at all, and construct a trellis to support the canes. Preferably after picking, or early the next spring, the old canes should be removed and the new ones thinned, so that they stand about a foot apart in the row.

Cultivation should be regular, thorough, and comparatively shallow throughout the season. Care should be exercised to prevent weeds and grass from getting a start among the plants in the row, as they will prove to be very difficult to eradicate. In case the soil is lacking in organic matter, cover crop can well be planted in the fall and plowed under the following spring. If one is used such as crimson clover that lives over during the winter, it should not be planted in the rows of plants.

By proper management, the raspberry plantation should remain productive and profitable for a period of from six to ten years, after which it will, in most cases, be advisable to renew the planting. The red varieties will produce satisfactory crops longer than the blackcaps.

Blackberries

That which has been stated relative to the planting and culture of the raspberry, applies equally well to the blackberry. The rows, however, should be 8 feet apart and the plants trained to the narrow hedge system, as suggested for the red raspberry.

at the first appearance of the insect, with a poison spray made by using an ounce each of lime and arsenate of lead paste ($\frac{1}{2}$ oz. of the powder) per gallon of water. In case a later application is needed, use an ounce of white belletore (fresh) per gallon of water.

SCALE INSECTS—The currants, and sometimes the gooseberries, become infested with scale insects. In such cases spray thoroughly just before the buds swell, using one gallon of commercial lime sulphur solution to eight gallons of water.

Grapes

Grapes should be spaced 10 feet apart in rows 8 feet apart. Spring planting is advisable. In planting, cut the roots back one-third to one-half, spread them well, and compact fine soil firmly about them. The top should be pruned to two buds and the weaker shoot rubbed off later in case both develop. The following spring the plant should again be reduced to two buds and, again, but one of these permitted to develop a shoot. By so reducing the top growth, one is enabled to obtain a vigorous vine development, because of a proportionately larger root system.

The trellis should be constructed during the second summer. Place the posts twenty feet apart. This places the posts five feet from the nearest vine with two vines between posts. Two strands of No. 10 galvanized wire should be stretched 30 and 56 inches respectively from the ground. The method of pruning the grape is quite commonly confused with the system of training. Pruning is essentially a thinning process, and has to do only with the removal of such wood as shall insure better and larger fruit upon the remaining portion of the vine, whereas training refers to the disposition of the different parts of the vine upon the trellis. There are but two methods of pruning, only the better of which—the long cane—will be considered in this discussion. By this method only long one-year-old growths are retained for fruit production. There are numerous systems of arranging these canes upon the trellis, some of which are better adapted to certain varieties and others to particular climatic conditions. But one system, the single-stem, four-cane Kniffin, which has given universal satisfaction, and is quite easily maintained, and consequently of value in the home vineyard, will be described. This system illustrates, in most part, the general principles of training and can readily be modified to suit individual ideas.

In pruning the grape, four basic principles must be kept in mind: first, fruit is borne in a few clusters near the base of current season's growth; second, these fruit-bearing shoots arise from wood that was produced the previous season; third, an accumulation of old wood checks the vigor of the vine; and, fourth, a vine can produce only a limited amount of good fruit. It follows, therefore, that the fruit-bearing wood must be renewed every year from the desirable one-year-old canes; that all wood over one year old and not necessary for the framework of the vine must be removed; and that a large amount of surplus new wood must be pruned out.

Training really commences at the beginning of the third season after planting. At that time the single cane developed should be cut back so that it extends but a short distance along the upper wire. At the next pruning cut back the main stem to slightly below the upper wire. Select two good canes that arise from near the end of this main stem and tie them along the wire to the right and left. Take two other canes that arise just below the lower wire and tie in a similar manner to the lower wire. Cut back the canes on the upper wire to five buds each, and those on the lower wire to three or four buds each. Cut off all other canes. The fifth season, new canes about the size of a lead pencil, and with plump round buds fairly close together, should be selected to furnish the new fruiting wood. These fruiting canes can be left slightly longer each year until the vine reaches maturity. Under average conditions a mature vine of a vigorous variety should be able to support twelve buds on each of the upper two canes and eight on each of the lower. The amount of fruiting wood to put up, however, will depend largely upon the variety and the vigor of the individual vine, and can best be determined by experience. Renewal spurs, containing but one bud each, should be left on or near the main trunk to supply fruiting wood the following season. By the use of these renewals one is enabled

to keep the fruit-bearing wood close to the trunk of the vine and thereby prevent the accumulation of surplus and consequently injurious wood. By such a system of training and method of pruning one has each year, after pruning, a vine consisting of a main stem or trunk that extends nearly to the top wire, a sufficient number of spurs to renew the fruiting wood the following season, and four one-year-old fruiting canes, two of which, containing twelve buds each, are tied to the right and left along the top wire, and the other two, containing eight buds each, trained in a similar manner along the lower wire.

The grape may be pruned any time during the dormant season. February and March are good months in which to do the work.

Grapevines may be profitably kept for a great number of years. When the trunk becomes too heavy, or if badly injured, the vine can readily be renewed by selecting and training one of the shoots that frequently arise from near the ground.

Insects and Diseases

Black Rot is probably the only disease that will cause serious injury. This disease can be effectively controlled by thorough spraying with bordeaux mixture, 4-4-50, when the shoots are six to eight inches long—just after the blossoms have fallen—and every ten days or two weeks afterwards until six weeks before the grapes mature. These later applications are of prime importance when rot has been observed previously and when the season is warm and moist. Keeping the vineyard free from mummied fruits, dead leaves, and prunings will assist materially in checking this disease.

ROSE CHAFER—The rose chaffer often does serious damage to the grape by eating the blossoms and young fruits. Spring cultivation will destroy a large number of the larvae of this insect. For more complete control the vines should be sprayed thoroughly when the insects first appear with three pounds of arsenate of lead, three pounds of lime, and one gallon of molasses in fifty gallons of water. In case one is spraying for black rot, the arsenate of lead and molasses can be added to fifty gallons of bordeaux mixture.

GRAPE BERRY MOTH—This moth is responsible for most of the wormy grapes found. The insect can be controlled with a spray composed of two pounds of arsenate of lead, two pounds of lime, and fifty gallons of water. The first application should be made as soon as the fruit has set, the second two weeks later, and the third from the first to the fifteenth of July. Frequently the spraying for the rose chaffer will come at the same time as the first spray for the berry moth, so that the one application controls both insects. The applications for the berry moth will control various leaf-eating insects that may be present.

THE YEAR'S WOODPILE

By E. L. Vincent, New York

"Wood enough to last a whole year! My! Wouldn't that be great!" Many a farmer's wife would speak that way if you were to suggest the idea of having a supply of wood big enough to keep the kitchen fire going during the whole round of the year.

And yet, every farmer can make his wife thus happy. The fires must be kept going; no doubt about that. And it is so much better to have on hand a supply of good, well-seasoned wood than to compel the wife to burn green wood.

Today is the day to begin getting such a pile, if one has not already done so. And once begun, keep the job booming till the pile is at least twenty cords big. More would be all right, but at least that will be required.

Cut and ready for the stove, the wood should be piled. For a good many years we had no woodhouse, so we piled the wood out-of-doors and laid boards over the top to keep off rain and snow. But we found out that too many ranks should not be placed side by side. If too deep, the wood is apt to lack air in the middle of the piles and get moldy.

A house is best, and on many farms there are old boards enough lying around to build one out of. Even then, ventilation should be provided. By laying some poles at the bottom and allowing the door to stand ajar, the needed air can be provided.

The best thing about this is, never to be harassed by having to stop to get wood when other work presses.

Have you such a pile? Better start one.

Grapes in Cold Climate

By W. H. Jenkins, New York

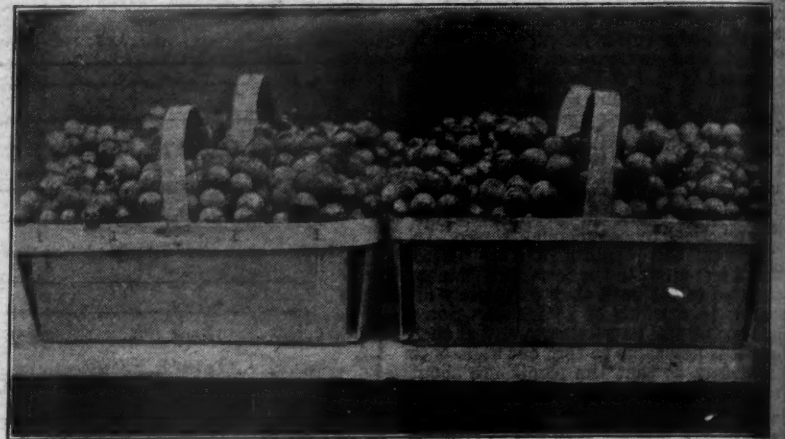
THOSE who live in the grape belts where climatic conditions are favorable, have little difficulty in growing good grapes. It is to help those who live outside of the natural grape section that I am writing my experience in growing a large supply of grapes for the family, with a surplus to sell in a village. Grapes, like apples, are a staple fruit, and most people do not tire of them. It is therefore worth while to make an effort to grow an abundance for the family, and this can be done in most parts of the country, even if climatic condition are unfavorable.

In southeastern New York, where I am located, the growing season, when frosts do not injure the grapes, is from May 20th to September 20th, although in some years this period is extended for a few days. This time is not long enough for some desirable varieties such as Concord and Niagara. I can usually depend on the Moore's Early and Winchell to ripen early in September. Worden will ripen well four years out of five, as will Delaware and Moore's Diamond. It should be understood that grapes which do not fully ripen

drilled between the strawberries, set in rows four feet apart, or a width that would best fit in the spaces between the rows of grapevines. The beets are used for feeding poultry. In three or four years the strawberries are reset, so I get a double crop. Probably I do not quite get a maximum crop of either strawberries or grapes, and cultivation costs more, but I am sure the combined crops are worth more than either grown separately.

Supports at First

I do not put up the posts for the wire until the second or third year after planting the grapes. They are in the way of cultivating the strawberries, and I prefer to let the small vines lie on the ground as the young vines are the more tender. The snow covers them and they do not winter-kill. I put up three wires, dividing the distance of posts six feet high. The small canes, having been shortened and pruned to one or two to the hill, are tied up to the lower wire in the spring, tying it along the wire so that the whole vine, or vines may be in the form of the letter T with extended



These Veagas and Concord Grapes were grown in New York, Out of the Grape Belt, laying down the vines in winter. They are ripe and best quality

are not a total loss as they can be made into jellies and marmalades and, if nearly ripe, into very good grape juice.

The varieties I selected for my little vineyard, and which I am pleased with, are Winchell, Moore's Early, Worden, Moore's Diamond, Delaware, Campbell's Early, Niagara and Concord. Some years all of these will ripen, and almost always they will ripen so that they can be used for some purpose. Because of vigorous growth and other desirable qualities, I have thought it best to retain some of the later grapes and take chances on their ripening.

Moore's Early is about the weakest grower I have and Worden the strongest. It is safer to lay down the Niagara, Winchell and Delaware in the fall in my locality as the canes are not sufficiently hardy to go through the coldest winter without injury. If I were restricted to two kinds, I would select Winchell and Worden as scoring the highest in good points in the family garden.

Planting the Vines

I bought one-year-old vines and in three years had a small crop of grapes from them, and a very fair crop in four years. My soil is well-drained clay loam with some eastern exposure. It was put in good shape for planting in the spring. The large growing kinds, like the Worden, I planted in rows about nine feet apart, and the smaller growing kinds, as Moore's Early and Winchell, in rows seven feet apart, and all about six feet apart in the rows.

As the ground was mellow and deeply cultivated, I was able to plant the vines rapidly with the spade. They were first trimmed by shortening the roots and cutting back the stems to one piece a few inches long. A line was stretched to get the row straight, then one person pushed in the spade the whole length, made an opening in which another inserted the vine in such manner that the roots were straight down and spread as much as possible, leaving the bottom of the stem just even with the surface of the ground.

The whole field was then set to strawberries and given good cultivation with a horse once or twice. Then beets were

arms. From this arm canes grow and cover the wires above.

This plan of training is for the hardy grapes that generally go through the winter safely on trellises. For the more tender kinds I use the renewal plan. When the cane is large enough to lay down, which is at two or three years old, it is cut off and another which has been growing for a year or two, takes its place. I think the two-year renewal system for tender grapes is best. When the new cane, which has been allowed to grow for the purpose of renewal, is put up, it is well to carry it to the top wire and there cut it off and train the laterals along the wires. It is the new wood growth of each year that bears fruit.

In our family grapes, next to apples, are most appreciated. Besides the large supply of fresh grapes, large quantities of them are combined with apples, or used alone, to make jelly, marmalade and different kinds of "spreads" which we think a good substitute for butter part of the time.

All the grapes that do not fully ripen are so used. There can hardly be an over-supply for these and for the making of fermented grape juice. I have found no trouble in disposing of any surplus in the village where I live. Writing from experience, I believe a small vineyard that is intercropped and well managed, is a good financial proposition, even in the sections outside of the natural grape belts.

BERCKMANS NURSERIES SOLD

The sale of the Berckmans Nurseries, in Augusta, Ga., to Mr. Sigmund Tarnok, is announced, and will be greeted with regret by the many who valued highly the name of Berckmans. It would be a great loss to American horticulturists should this name disappear from among those who are actively engaged in the nursery business. We are pleased to note that two of the Berckmans brothers will continue to do special work as consulting horticulturists. To Mr. Tarnok, who is very highly spoken of, we extend a welcome and the wish that he may succeed in carrying on the excellent tradition of Berckmans.

The Orchard for the Home

Should be Large Enough to Pay the Owner to Spray and Give Proper Care.

By Paul C. Stark, Associate Editor

"WHAT is the proper size for the home orchard?"

This question is often asked and has been discussed from every angle at horticultural meetings for years, and various suggestions have been made. Some authorities who have seen the poor care often given to home orchards, have advocated an orchard as small as twenty-five trees, but in most cases larger orchards have been advised.

In my judgment, a home orchard for best results should be large enough to justify buying a spray pump, and worth taking care of properly; therefore after giving the subject quite a little thought, and observing farm orchards in different sections, I have come to the conclusion that an orchard of about two acres is, everything considered, best for the farm home.

Of course, the two acre orchard will produce more fruit than is necessary for the use of one family, but the local market is always ready for the surplus, and it will always bring the grower a good profitable price. There is no reason why an orchard of this size should not bring a profit of \$200.00 to \$300.00 per season, for the extra fruit that will not be required for use in the home and this extra money is always welcome.

An orchard that is worth planting at all is worth careful thought and considerable planning, and many things should be considered. Knowing this, I have had a sketch prepared, drawn to scale showing, as I see it, an ideal home orchard. This orchard is large enough to pay any man to give it a little care, and if the plan of planting I have outlined is followed, I believe the planter will find that he has just about what he needs.

Where to Plant

After a decision has been reached to plant an orchard, the first problem is to select a proper location. Do not select a piece of ground because it is fit for nothing else. Select good land and avoid planting in hollows or pockets as frost injury is more serious in low places. Be sure that there is sufficient drainage, so water will not stand, and for convenience it should be as near the house as possible.

Right at the start, lay off the two acres that you intend to develop, measure off the ground carefully, get the exact size, and then build a fence around it. Resolve right at the start that you will protect your trees; then start right by protecting them against stock. Prepare your ground by breaking it deeply and ordering it as carefully as if you were preparing it for any farm crop.

Lay off your rows carefully, so that every tree is in line; place the trees exactly where they belong. Take pride in planting it right—straight rows will add much to the orchard's appearance.

In digging holes for your trees, dig them large, to admit all roots without bending or crowding. Cut off all broken or bruised roots back to good wood, and in planting, let the tree stand from one to two inches deeper in the orchard, than it stood in the nursery row. The dark ring at the base of the trunk will show how deep the tree stood in the nursery.

Planting the Trees

In planting, press the dirt firmly around the roots. After you have an inch or two of soil over the roots, there is no danger of bruising them by hard tramping or pounding the soil. Be sure the dirt is tramped or pounded solid around all of the roots, so as to leave no air pockets, which often cause the roots to dry out, and sometimes cause the death of the tree.

Years ago, an old-time horticulturist in one of his thoroughly practical catalogs, carried the following, to drive home his point that easy handling of trees at planting time is dangerous. The point is so well brought out, and the application so timely that I reproduce it:

"What is considered the best of care is often very bad care. It is amazing to see the inexperienced planter on his knees, pressing the earth in around the roots with his fingers for fear of crushing the fibers. It is impossible to get the earth properly packed around roots in this way.

"Wide let its hollow bed be made, There gently lay the roots and there Sift the dark mould with kindly care, And press it tenderly.

As 'round the sleeping infant's feet You softly fold the cradle sheet, So plant each shrub and tree—

"Is good poetry, but bad practice—except the wisely practical first lines."

The orchard can, in most localities, be planted either in the fall or spring, as suits the planter's convenience. I have never been able to see very much difference. If planted in the fall, do not cut back your trees until spring, as the new cut

large lots, as well as the usual run of vegetables in smaller quantities.

If you plant a home orchard, make it pay. Make it bring returns while the trees are growing. Then so handle the trees when they begin to show fruit buds that they will bear clean, good-sized fruit. This is not a big undertaking. It requires a little thought and a few hours' work, now and then.

Spraying Not Expensive

Too many men with home orchards look upon spraying as an expense that can be eliminated. This is the wrong idea; spray-

ever issued. The experiment station men will give all inquirers full instructions for spraying, and valuable literature on this subject will also be gladly sent by the spray pump manufacturer, the insecticide dealer or the nurseryman, and many of them have established service departments to help anyone who writes them about their orchard troubles.

Varieties Recommended

I have given the subject of varieties a great deal of thought, and have chosen the following sorts for my ideal home orchard, and the sketch will show just how I would plant them. This isn't the only way to plant an orchard, and there will be some who will disagree with me on varieties. But this method is good, these varieties are good, and any man who follows the plan herewith will not go wrong. I have seen all these varieties fruiting not only in my own orchards but in home and commercial orchards in different sections. These recommendations are not based alone on my personal experience but also the observations of orchardists and experimenters throughout the country.

Apple

Of course the apple is of most importance, so I name it first. Benjamin Buckman, one of America's most widely known experimenters, has an experimental orchard of over 2,000 varieties, and the trouble with many who are planting a home orchard is that they try to follow his lead and plant one or two trees of practically all the varieties their nurseryman lists. Mr. Buckman is a scientific experimenter, but the home orchardist is not. Select just a few good sorts. My choice would be the following, ripening as named: Liveland Raspberry and Yellow Transparent for early summer, Maiden Blush and Wilson Red June for late summer, Wealthy for fall, Jonathan and Grimes Golden for the holidays, Delicious; Black Ben, King David, Stayman Winesap for winter. This selection covers all seasons and gives good fruit from early summer until the following spring. This list is chosen with the central west in mind; if far north I would change the list some and add McIntosh, Northern Spy and other extremely hardy kinds, and in some sections would add Baldwin; in the south would add Paragon, Champion, etc. However, the list as given is good practically all over the country.

According to this plan there are five rows of apples, planted 30 feet apart each way, 9 trees to the row, or 45 trees all told. Plant the outside row to Black Ben, the second row Delicious, the third row 5 trees of King David and 4 Stayman Winesap, the fourth row 3 trees each of Wealthy, Jonathan, and Grimes Golden. The fifth and last row 3 Liveland Raspberry, 2 Wilson Red June, 2 Yellow Transparent and 2 Maiden Blush.

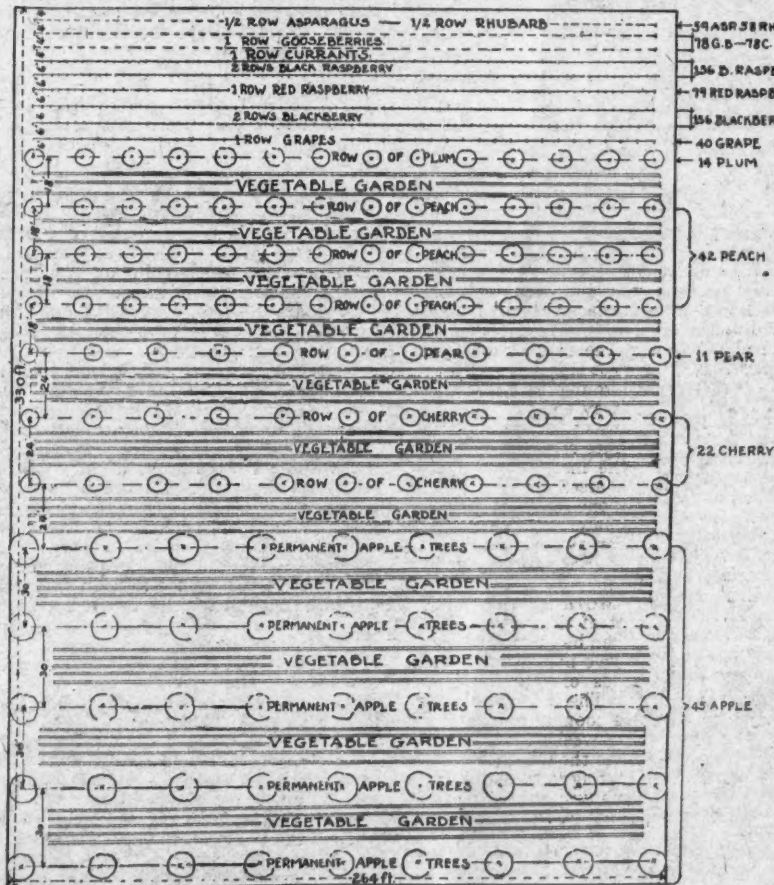
Filler trees can be used in making the apple planting if desired, planting for this purpose summer varieties or young bearing winter kinds. These fillers, however, must not be allowed to stand after the trees for the permanent orchard need the space. By using fillers the apple trees will stand 30 feet by 15 feet until the fillers are removed.

Cherry

Twenty-four feet from the last row of apples is the first row of cherry. The second row of cherry is 24 feet from the other row, with trees placed 24 feet apart in the row. Making room for 22 trees. My idea would be to plant 11 trees or one entire row to Montmorency and the next row 7 Dymond and 4 Suda Hardy. The above are, of course, tart cherries and if a sweet variety is wanted it can be added in the first row, and I have found that Black Tartarian is one of the best.

Pear

Blight is the one great pear enemy, so I would suggest quite a number of Lincoln (True Lincoln of Illinois). Mr. Thos. F. Rigg of Iowa told me a short time ago that they had not blighted with him after bearing for ten years. In Benj. Buckman's orchard at Farmingdale, Ill., they have



TWO ACRE HOME ORCHARD.

may kill back slightly, because of extreme cold. If planted in the spring, cut back your tree immediately after planting.

In pruning apple trees, cut off all limbs except the ones you wish to leave for the permanent frame-work of the tree and cut these limbs back about one-half. Peach should be severely cut back; remove the leader, cutting the tree down to 18 to 24 inches; reserve three to six branches for the frame-work, removing all other branches, cutting these back to stubs with one or two strong buds. Prune pear and plum in about the same manner as the apple. Cherry should not be pruned at all; just remove broken limbs, but do not cut back the branches. When grapes are planted, cut back each cane to one or two strong buds.

After your trees and plants are in the ground and properly pruned, give them some cultivation, keep the soil loose and if a fertilizer is needed, use it. We have found that well-rotted stable manure is one of the best orchard fertilizers. Place it around the tree, keeping it away from the trunk. Do not work it into the ground; let the rain carry its strength to the roots of the trees.

The space between the tree rows can be utilized for vegetables. For many years this space will not be required for the trees, and growing garden crops will really help the growing fruit trees. These middles can be made profitable by growing Irish potatoes, sweet potatoes or onions, in rather

ing is just as necessary and just as reasonable as plowing corn or hoeing potatoes—it must be done in order to secure satisfactory results. I never could get the viewpoint of the man who is successful with his farm crops and with his stock, and yet permits his orchard to grow up in weeds, and turns his fruit over to the worms.

Spraying is not very expensive. Of course it takes a little time and costs something, but the results are always such as to make the expense seem very small. I consider the money spent for spraying in the home orchard one of the best farm investments. For the orchard I have outlined, an expensive spray outfit is unnecessary; a fifty-gallon barrel pump is all that is required. These sprayers are easily operated, are inexpensive, and if used with judgment, will insure fruit free from worms and blemishes, and healthy, clean trees. The planter should make up his mind when he plants his orchard to buy a spray pump and to use it.

Many farm homes can often use this sprayer to advantage in other ways. The chicken house, in nine cases out of ten, would be a much better and healthier place for the fowls if the right kind of spray was used occasionally, and the same is true of the barn and other outbuildings.

The up-to-date farmer now receives bulletins from his state experiment station, and reads them. If he doesn't receive the horticultural bulletins, he should promptly ask that these bulletins be sent him when-

blighted but little. Others report the same good quality, so I would make at least half the pears Lincoln. Then I would use a few Kieffer, Seckel and Anjou. Plant them 20 feet apart and I would plant 6 trees of Lincoln, 2 Seckel, 2 Anjou and 1 Kieffer.

Plum

The one row devoted to plums requires fourteen trees 18 feet apart. Plant four Omaha, four Early Gold, two Shropshire Damson, two Abundance and two America.

Grape

Eclipse, Moore Early, Concord and Worden are the best black kinds, ripening in the order named. Use Diamond for white; Lutie for red. The row requires 40 vines. Use above varieties in about equal numbers; planting them six feet apart.

Peach

Red Bird Cling and Mayflower have proved the best of the very early kinds, and I would follow them with Eureka, Alton, Early Elberta, J. H. Hale, Late Elberta, Mammoth Heath, Cling and Krummel October, ripening as named. All are good, hardy varieties. Eureka is the

hardest of all good peaches; this year in my orchard it bore some fruit although last winter the thermometer registered 26 degrees below zero.

These should be planted 18 feet apart in the row or 42 trees for the three rows. Would suggest one row of Early Elberta, one-half row J. H. Hale, the other one-half row to Late Elberta. Then I would divide the last row up among Red Bird Cling, Mayflower, Eureka, Alton, Mammoth Heath Cling and Krummel October.

Gooseberries

Seventy-eight required, planted 3 feet apart. Use Houghton and Downing—both good proven kinds.

There are too many farm homes in our great central western country, and elsewhere, that depend on very uncertain and high-priced markets for their fruit instead of producing it. I have never heard of a valid excuse why a landholder should not grow his own fruit. The well-cared-for home orchard is a sign of prosperity on any farm; the uncared-for orchard, grown up with weeds, limbs broken—a "ragged looking" orchard—generally is an indication of an insanitary home, a poorly built barn that gives no protection to stock,

fallen down fences, etc. The well-cared-for orchard is the emblem of success, happiness, and contentment.

E. G. Kains, the well-known horticultural author, in a recent article in "Country Life," made some statements regarding the planting of home orchards that should be read and carefully considered. This is what he says:

"The effects that the war is having on fruit growing are many. First, countless orchards have been ruthlessly destroyed, as everyone knows. Supposing that men were available to re-establish these plantations, it will be many years before quantities of fruit approximating pre-bellum amounts will be produced. Therefore it seems probable that exports from America will be large, perhaps larger than before the war. Hence in this country we may expect a shortage of commercial varieties of apples and of fruits sold in manufactured forms. Other factors that will help to emphasize this shortage are reduced plantings, especially during the past four years, and to a less extent for several years prior to 1917. The difficulty of getting skilled labor in nurseries and fruit plantations, the efforts of farmers to grow grain instead of fruits, and the losses of fruit

American Fruit Grower

because of inadequate transportation facilities. The effect of these and similar factors is to reduce fruit planting and production and to increase the demand and the price at home and abroad. The planting of home orchards and fruit gardens is therefore one of the most profitable investments that can be made."

Blackberry

I believe Mersereau is the best all-around berry. There are other good ones, but my choice is Mersereau. Early Harvest is very early, but not perfectly hardy; 156 plants are required, three feet apart.

Raspberry

Cumberland is without doubt the best blackcap. The old reliable Cuthbert is probably the best, most dependable, red sort. The plan calls for 79 red and 156 black. If a few vines of a purple variety are wanted, use Cardinal. They should be planted 3 feet apart.

Currants

Seventy-eight plants are required for the row of this somewhat neglected fruit. Use London Market, White Imperial and Black Naples, planted three feet apart. Currants make excellent jelly.

Instructions for Pruning Apple Trees

By R. T. Osburn, Arkansas

PRUNING is a subject upon which much has been said and written. Nearly all orchardists have realized that pruning is a necessity. There are many things to be taken into consideration in pruning a tree, the form of the tree, habits of growth, and the formation of fruit buds.

The tree should be as nearly ideal in form as possible and present a symmetrical appearance. Habits of growth should be remedied; upright trees pruned to be more spreading, and drooping trees to be more upright. Formation of fruit buds may be regulated by pruning, when done,



Jim Wakely Demonstrating Pruning 1-Year Apple

extent of cutting, and kind of work done.

Age and condition of trees are an important factor. Young trees need a cutting back and thinning out of growth to force out dormant buds and a good lateral growth, while old trees will probably need many large limbs eliminated, and a thorough thinning of the fruit-bearing wood to stimulate the formation of good strong fruit buds.

On trees that are making very little growth, and where the buds are small and weak, a severe winter pruning will cause both a wood growth and fruit-bud formation; and on trees that are heavily fertilized a moderate winter pruning will give good results, and better if followed up in the summer with a thinning out of the smaller limbs.

Many large limbs cut off the body of the tree affect the whole tree, but the greatest effect is felt where the cut is made, causing a growth of water sprouts at this place. If these are not removed in the summer they will take the place of the limbs cut off, resuming the growth and destroying the effect of the pruning.

The thinning out of small limbs and twigs is the kind of cutting that has the most effect on the tree, and from which the greatest benefit is derived. Do not attempt this kind of work until after all the

necessary large limbs have been removed. As there are no two trees alike, each tree presents a new proposition. The pruner should exercise good judgment and leave the limbs properly spaced. He should have in his mind what the tree will look like when finished before attempting the work.

Unpruned Orchards

Many orchards have not been pruned from the time the young trees were set. Such trees have not the proper framework to make a good strong tree. Limbs are too numerous and the growth, that should have gone into a few well spaced limbs, has been distributed through a great number, with the consequence that the limbs are small and weak. The pruner must work to overcome this defect which will necessitate the removal of a great many limbs from the body of the tree. The growth will then be directed into the remaining limbs causing them to become larger and stronger.

The center of the tree should be opened up to admit sunlight and air. The tops of many trees grow too high and upright and should be reduced by cutting out upright limbs entirely, or cutting to a good side branch directing the growth outward from the tree. The long leaders often need cutting back to strengthen them in order to carry a load of fruit. Each limb of a tree should bear up its own load of fruit and the pruner must take this into consideration, and work with this end in view.

The limbs of a low-headed tree may gradually grow upward and make a higher top than a high-headed tree where the limbs are drooping. Do not cut out limbs simply because they are low on the body or leave limbs because they are high on the body. It is the general course and direction, and their location in regard to other limbs that is to be considered. I believe in growing apples up off the ground and there are many trees where the limbs have been borne to the ground by a load of fruit. Do not cut these limbs off unless the tree can spare them and have sufficient fruiting wood left, but prune them on the underside, raising them as much as possible, and cut the ends to throw the growth upward.

Proper Cut Not Injurious

Cut all limbs close leaving no unsightly stubs to die back and cause permanent injury to the tree. The healing substance of a tree flows downward through the cambium or inner bark. A large cut on the body may heal as quickly as a small one on a small limb because the healing of a wound is regulated by the size of cut and the amount of leaf surface extending beyond the cut.

The right kind of pruning has never killed a tree yet, but has saved thousands from a premature death. Pruning will remove the causes of many diseases, put the tree in a healthier condition and render it less susceptible to disease. In most un-

pruned trees there are probably one or more dead limbs. This is a process of elimination constantly going on in nature; it is nature's way of pruning.

To prune the tree, begin with a saw on the body. Cut out all limbs from the body beneath the framework. See that the framework limbs are well spaced around the body. Remove limbs growing out from the framework toward the ground. When the framework limbs are horizontal this is necessary, but when the framework grows upward these limbs usually take a horizontal growth. Cut out all limbs growing upright through the tree from framework. When parallel limbs are too close remove the most undesirable ones. Cut out cross limbs and those growing across the center. Upright limbs in the top should be cut out entirely or cut back to a good side branch. See that all limbs lead outward from the body of the tree. Try to keep the wood well distributed throughout the tree.

Thinning Small Limbs and Twigs

After sawing everything large enough to saw, use the double-cut hand-pruners on small limbs and twigs. Cut all sprouts and twigs from the body below the crotch, but keep all of those possible above the crotch, cutting out the water sprouts and clipping back the spurs where they are too long. Go over each large limb thinning out and cutting back small limbs. Each large limb projecting outward from the body divides and divides itself into smaller limbs until they form a circle around the body. These limbs cross and recross often forming a mass of small limbs. Here is where the most clipping is to be done, limbs growing upright into limbs above them, limbs growing downward into limbs below them, limbs growing toward the ground, limbs projecting out too far into other limbs; these should be removed or clipped back until the proper space is attained. The amount of thinning to be done, depends upon the condition of the tree.

Subsequent pruning should be done, thoroughly and systematically each year. Trees tend to become dense again after pruning. Water sprouts and young growth, which will be forced out all over the tree, will need attention. Many trees, after bearing a heavy crop, will likely have broken limbs, lower limbs closer to the ground, and the tops, previously upright, drooping over on limbs beneath. This and other changes constantly taking place, cause the tree to require an annual pruning.

Benefits and advantages of pruning are many. Opens up the top of the tree allowing sunlight and air to penetrate which is necessary to the formation of good strong buds. Remedies defects of growth and builds up a stronger tree. Fruit will be larger and have a higher color. Puts the tree in condition to be more thoroughly sprayed which means a healthier tree, fewer insects and less fungous disease of the

apple. Trees are less susceptible to canker and other diseases.

As a rule, when a cut fails to heal, the disease had already made its entrance before the cut was made. Pruning would



A Properly Pruned 2-Year Apple at Planting Time

have prevented this had it been done in time. Trees will have more uniform and regular crops. Will overcome the tendency of a tree to become barked. Pruning is fertilizing by taking off all surplus growth, which has the same effect as fertilizer. Reduces cost of spraying by requiring less spray. Reduces cost of picking; apples are easier to reach, larger in size, and fewer culls to pick. Improves the looks of an orchard, and a good-looking orchard is not only a pleasure to the owner but an honor to the country.

A TEMPLE OF AGRICULTURE

Blair Campbell, Illinois

Mr. W. E. Skinner deserves, I believe, the credit for the suggestion that a temple of agriculture be established. It sounds good to me. Such a building would act as an inspiration and be a nucleus for the agricultural interests of its section. Possibly Mr. Skinner intended one great temple of agriculture for the whole United States, but this appears to me too large an order and such a building would not fulfill the purpose so well as several scattered through the great agricultural centers of America.

With Our Editor

A Word of Greeting

AS ANNOUNCED in the February issue by our Editor, Samuel Adams, he and I have been jointly interested in this magazine since the incorporation of the AMERICAN FRUIT GROWER COMPANY.

The growth and scope of this publication, coupled with an earnest desire to give our readers the fullest and most efficient service, has induced me to undertake a more active part in the management of the AMERICAN FRUIT GROWER, thus relieving Mr. Adams from the double burden of Editor and Publisher, and allowing him to devote his undivided attention to the editorial development of the magazine.

As the new Publisher, I bespeak for myself the continuance of the hearty and gratifying support accorded Mr. Adams by subscribers, advertisers and agencies, and I welcome the opportunity to serve you in fuller measure, and in the closer and more intimate relation which my duties as Publisher now afford me.

ROBERT B. CAMPBELL, Publisher.

Keystone of Success

WHAT is the keystone of success for fruit growers? If you were asked this, we hope your reply would be "co-operation" for that's the right answer. Year by year, we might say month by month, this is being proved. Think of the uniform success of the big fruit growing associations of the northwest. The Almond Growers Association is, we believe, the latest of these, but perhaps before you read this there may be more recent ones.

Co-operation is not going to make a success out of nothing. If you do not grow good fruit no amount of co-operation will bring you success, but so kind is nature and the climate of the United States, that almost all of us can grow good fruit if we give the matter proper attention.

In union there is strength. We were reading lately an interesting book of travels, "The Old World Through Old Eyes," by Mary S. Ware, when we came upon this significant passage. In the Boer settlements of South Africa locusts were such a plague that whole harvests of grain were devoured year after year and the losses were immense. The government could not combat the superstition of the Boers that the locusts were a dispensation of Providence and that man was powerless against them. At last the government offered to pay liberally per bushel for locusts, and gave the Boers instruction in how to kill them. A great start was made in controlling the pests, and then the killing was made compulsory. A central station is now established which receives telegrams from any place where a locust appears. A force of men is immediately sent to this place and the invasion checked. No one fears the scourge now, for co-operation under government control has done away with it.

Do you think the Boers would have been better off if they had stuck out for individu-

alism and allowed their crops to be devoured year after year? Do you think the fruit grower is better off because some careless, indifferent growers claim the right "to grow and market fruit anyway they darn please?"

The great war should have taught the most unobservant of us the advantage of standing together. Where would we have been today if the allies had not taken the last step in co-operation and combined under a common head? From that moment they went forward, though up to that time, in spite of earnestly striving to do their best with the good of all at heart (which is much more than can be said for the selfish grower), they made but little progress.

If the South African government could make its people kill the locusts for their own good, should not fruit growers be able to compel each other to grow clean, sprayed fruit for the benefit of all? It is only necessary to take steps to prevent inferior fruit reaching the market to insure the desired result. Nothing could be more obvious than the immense increase in influence, both political and financial that would accrue from co-operation. No one man can pay to advertise his fruit beyond a certain limited extent, but see the great, striking advertisements of the big fruit associations, and remember "It pays to advertise."

Fruit Growers' Accounts

HOW ABOUT that account book which you have been meaning to get? If you can show it to us we will agree that you have started the New Year right. If you cannot, then we are safe in telling you that no business left to look after itself in this respect, is making a maximum profit. You may be "getting along" because your success depends largely upon the bounty of nature, but unless you have a definite idea of where your outlay is going, and what your income is coming from, you are not making the money you might.

Too many farmers were made to blush last year when the necessity of making income tax returns proved to them how little accuracy there was in their knowledge of their own business. Even these were in a healthier condition than those who did not blush because they did not perceive where they had been at fault.

Have you figures to show what you spent on direct orchard practices last year, spraying, fertilizing, pruning, cultivating? If you bought a tractor are you in a position to state positively what saving it has been to you in time and money? Can you judge, from your knowledge of the expense your teams were to you, whether it would pay you to purchase a truck? Yet these are important things for you to know.

Like other good habits the keeping of accounts is much harder to start than to persevere in. Soon it becomes second nature. If you once realize the satisfaction of being able to put your finger on the figures when in doubt about the cost or profit of certain operations, you will not wish ever

again to be without such a source of reference.

A farm paper says, "By all means take an inventory of your farm. Then do all your business by check on the bank, and list on your deposit slips the source of your income." Is there any fruit grower who does not feel willing to take at least this measure of precaution? If you start on this very simple plan we are sure you will soon realize the importance of keeping more elaborate and detailed accounts.

If the fruit farmer is to take the long lead to which his occupation entitles him, he must conduct his business in a business-like manner. We would like to know that there is a complete set of accounts on every fruit farm. On the larger orchards, where there are many transactions of every kind of orchard operation, we believe it would be rewarding to the orchardist to install an adding machine, which would relieve the accountant of much detailed mental effort and would insure absolute accuracy.

The Morale of Service

THE soldier who possesses this intangible, essential quality, is never found to be concerned about carrying out the bare letter of a command. He wants to do just a little more—always. Ambition consumes him, the longing to "do his durndest."

We know the vital importance of keeping up this spirit in our armies. Have we thought about keeping it up in other branches of service? Our own, for instance, and our hired man's? It's just as important in the field of fruit as on the field of battle. Every employer knows what it is to deal with labor that feels no interest in results, no ambition to push things forward, no real concern save to end the day and draw the pay.

Such employees, in their aloofness and remoteness from the matter in hand, more nearly resemble disembodied spirits than is at all satisfactory for the employer to deal with. What we need in our hired help is good morale. How should we set about getting it?

When we wanted to insure it for our soldiers we got behind them with our money and our minds. We gave lots of thought to their health and comfort, and we did it without grudging or grumbling. Without any idea that we were, after all, pretty good fellows to do so much cheerfully for the boys who were fighting for us.

Why not try the same spirit on your hired man? The boys have responded magnificently to our practical sympathy. Your hired man will do the same when he sees that you are personally concerned for his welfare. He is a man as well as yourself; probably a husband and father. The health and advancement of his family lie near his heart. Give him a square deal. Don't expect him to be more decent than the quarters provided for him. Don't expect him to take more interest in your job than is warranted by his share in its benefits. Keep him with you by keeping him satisfied. It will pay you well.

Spray Schedule for Fruits and Vegetables

By A. S. Colby, Department of Horticulture, University of Illinois

APPLE

What to Spray for	Treatment	When to Spray	Remarks
San Jose Scale Oyster Shell Scale Scurfy Scale	Lime Sulfur (winter strength) Miscible Oils	In dormant season; when trees are leafless.	Protect men and animals at work from caustic action of Lime Sulfur on the skin.
Apple Aphid	Nicotine Sulfate. Add a little soap to make it spread.	In spring when buds are bursting showing green tips.	Of no use after leaves are curled. Use high pressure.
Scab Black Rot Bud Moth Canker Worm Tent Caterpillar	Lime Sulfur (summer strength) with Arsenate of Lead.	When flower buds show pink, but before any have opened. (Other sprays as recommended for codling moth, below, will incidentally control troubles in this group.)	In severe cases of canker worm use Paris Green 4 oz. in 50 gallons of water with twice as much slaked lime.
Codling Moth	Lime Sulfur (summer strength) with Arsenate of Lead.	(1) When most of the petals have fallen (calyx spray). (2) Approximately three weeks after the bloom. (3) Approximately ten weeks after the bloom. (4) Fifteen to seventeen weeks after bloom.	After weather becomes hot (from about July 1) discontinue Lime Sulfur and use Bordeaux-Arsenate.
Blotch Curculio	Lime Sulfur (summer strength) with Arsenate of Lead. Bordeaux Arsenate of Lead.	(1) As in (2) under codling moth (above). (2) Approximately five weeks after the fall of the bloom. (3) As in (3) under codling moth (above).	Necessary in southern sections where may be three broods in one season. Clean orcharding assists in curculio control. Spraying not always wholly effective. Arsenate of Lead may be omitted if no curculio is present.
Sooty Blotch Fly Speck		Usually checked as incidental result of applications recommended above.	More common in regions where air and water drainage is poor.
Bitter Rot	Bordeaux.	Where disease is looked for begin spraying in midsummer, making applications often enough to keep fruit protected by being coated all the time.	
Apple Rust or Cedar Rust	Spraying not effective.	Remove cedar trees nearby.	The rust cannot live without cedars on which it spends part of the year.
Blight		See under Pear, Fire Blight.	

PEACH

San Jose Scale Peach Leaf Curl	Lime Sulfur (winter strength.)	Any time in dormant season but not later than 2 weeks before bloom in spring.	
Curculio	Arsenate of Lead with 2 lbs. of properly slaked lime in 50 gals. water.	(1) About ten days after the bloom, as the shucks are being pushed off by the young fruit. Others as given below for scab and brown rot.	
Scab Brown Rot	Self-boiled Lime and Sulfur with Arsenate of Lead.	(1) About four weeks after bloom. (2) Midseason and late varieties may require an application of self-boiled lime and sulfur alone, four to five weeks before fruit ripens. If weather is damp and warm additional sprays will be necessary.	Do not spray nearer than 2 weeks to picking time.
Borers	Preventive washes, Mechanical protectors, etc., of little value.	Dig out with knife and wire in fall and spring, then mound up earth around trunk 8 inches.	Trees must be looked after twice yearly.
Gummosis		Hardly a disease but an indication that the tree is living under some unfavorable condition, such as an ungenial soil. Discover and change the unfavorable environment for the better.	
Bacterial Shot Hole		Spraying helps but indirectly. Keep up the vigor of the trees by good cultural methods and application of plant food.	

CHERRY

San Jose Scale Forbes Scale	Lime Sulfur (winter strength).	While tree is dormant.	No scale on sour cherry.
Curculio Brown Rot Leaf Spot Shot Hole Fungus	Lime Sulfur (summer strength) with Arsenate of Lead.	(1) Just before buds open. (2) Immediately after blossoms fall. (3) About ten days after (2). (4) Additional sprays if necessary at two-week intervals.	In some localities it may be safer to dilute the lime sulfur somewhat, preventing foliage injury.
Cherry Aphid	Nicotine Sulfate.	When aphids first appear before they have caused the leaves to curl.	Be careful to cover underside of leaves. Use high pressure and soap.
Cherry Slug	Arsenate of Lead.	On first appearance of insects.	

CURRENT AND GOOSEBERRY

Leaf Spot Anthracnose	Bordeaux.	Beginning as soon as the leaves are opened make 5-7 applications at 2-week intervals.	
San Jose Scale Oyster Shell Scale	Similar to apple which see above.		
Current Worm	Arsenate of Lead.	At the first appearance of the worms. If there are two broods repeat spray.	Dry Hellebore may be dusted on it near picking time.
Current Plant Louse	Nicotine Sulfate.	Soon after eggs hatch in spring (soon after the leaves open).	Thoroughness necessary, hitting all leaves from beneath.

GRAPE

Anthracnose Black Rot Mildew	Bordeaux Mixture.	(1) Just before buds open. (2) After blossoms have fallen. Two or three others at 10-14 day intervals.	Careful winter pruning and disposal of diseased wood with application of Lime Sulfur (winter strength) in dormant season aids in anthracnose control.
Berry Moth Leaf Hopper	Add Arsenate of Lead to Bordeaux.	Follow program recommended above when these insects are prevalent.	Dusting with fine sulfur is recommended for some vines of European origin for mildew control.
Root Worm	Arsenate of Lead.	(1) As soon as beetles appear. (2) Ten days after.	Stir ground well especially near roots, up to middle of June, to break up cells where immature beetles live over winter.

PLUM

San Jose Scale European Fruit Scale	Lime Sulfur (winter strength).	When tree is dormant.	
Curculio Brown Rot Leaf Spot	Lime Sulfur (summer strength) with Arsenate of Lead.	Similar to cherry, which see.	Brown Rot spreads very rapidly in warm, moist weather and can be controlled only if fruit is kept coated.

BLACKBERRY

Orange Rust Cane Blight Crown Gall Anthracnose	Dig up and burn all infected plants as soon as noted. Lime Sulfur.	Since these diseases are perennial in the canes, spraying is useless after first infection occurs. (1) In spring before growth starts (2 1/2 gal. in 50). (2) When new shoots are 6-8 inches high (1 1/4 gal. in 50). (3) Just before blooming period. Dilute as above.	Do not plant infected stock or use ground previously infected.
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RASPBERRY

Some diseases and treatments as for Blackberry, which see.

STRAWBERRY

What to Spray for	Treatment	When to Spray	Remarks
Leaf Spot	Bordeaux.	Before blossoms open. Additional applications if spot appears.	Renew beds frequently. May move off and burn foliage after berries are picked.

PEAR

Fire Blight	Spraying ineffective.	In some cases where particular care is taken, prompt and severe pruning at the first sign of blight, disinfecting tools and wounds with corrosive sublimate solution, may check its spread to some extent.	
Scale Insects Blister Mite Pear Paylla	Lime Sulfur (winter strength.) Miscible Oils.	In dormant season, preferably early spring.	Scrape dormant trees and burn all orchard trash to aid in paylla control.

Practically all the other common diseases and insects on the apple are also found on the pear to some extent. See methods of control under apple (above).

ASPARAGUS

Beetles	Arsenate of Lead.	When beetles first appear, followed at 10-day intervals as necessary. Also on old plantations after cuttings cease.	Do not spray while cutting for use.
Rust	Control unsatisfactory.		Secure resistant variety, like <i>P. metto</i> .

BEAN

Anthracnose	Pick and burn diseased pods.	Since this disease is carried on the seed, use seed only from healthy plants, preferably from a disease-free locality.	
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CABBAGE

Cabbage Worm Cabbage Looper	Arsenate of Lead or Hellebore.	Arsenate of lead when worms first appear. Repeat as necessary till heads are formed. Then use hellebore.	Add a little soap to the water to make the poison stick.
Cutworm		Wrap paper around the stem when plants are set, sinking it in soil.	Avoid planting on sod land.
Club Root	Pull up and burn plants.	Spread lime on ground in spring, 1 lb. to 8 sq. ft. Work it in before setting plants.	Practice rotation. Avoid infected land. Do not wet diseased plants.
Black Rot	Pull up and burn plants.	Soak seed 15 minutes in corrosive sublimate to kill spores wintering thereon.	

CANTALOUPE AND CUCUMBER

Bacterial Wilt		Kill the beetles which spread the disease (as below).	
Anthracnose Downy Mildew Melon Rust	Bordeaux.	When vines begin to run. Follow with 2 more applications at two or three-week intervals.	Use a short spray rod with nozzle to reach the underside leaves for cucumber troubles.
Striped Beetle	Bordeaux with Arsenate of Lead.	As beetles appear. Repeat as necessary.	Bordeaux aids in repelling beetles.
Melon Aphid or Louse	Nicotine Sulfate.	On first appearance of lice. Repeat as necessary. Pull up and burn badly infested plants at once.	
Squash Bug		Pick the bugs and crush them. Place small piece of board near the hills, collecting bugs found underneath every morning.	May cover plants with cloth protection. Leave several small openings in field after first frost. Cane and burn cucumber insects will collect thereon in large numbers.

CELERY

Leaf Spot	Bordeaux.	On young seedlings in seed bed. Follow by three later sprayings at 2-week intervals if necessary.	Some varieties seem more resistant than others.
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CORN—POP AND SWEET

Smut	No satisfactory remedy.	Cut off and burn smutted areas before they break open.	Rotate crops.
Corn Ear Worm	No satisfactory remedy.	Dry arsenate of lead is sometimes dusted on before the corn ear fully silks out.	Kill the worms as found as soon as prepared for use.

LETTUCE

Drop or Wilt	Pull and burn diseased plants at once.	Soak the diseased area with Bordeaux or with CuSO ₄ solution, 1 lb.: 7 gal. (12).	Burn all lettuce trash.
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POTATO

Early Blight	Bordeaux.	When plants are 6 inches high. Make 2 more applications at 2-week intervals.	Bordeaux arsenate of lead is a usual combination spray for potato field diseases.
Late Blight Tip Burn	Bordeaux.	Continue spraying as above at 2-week intervals if thought necessary throughout season.	
Colorado Potato Beetle Flea Beetle Scab	Arsenate of Lead.	When young beetles first appear. Repeat as new broods hatch.	When Bordeaux is used in a combination spray it tends to repel the Flea beetles.

SQUASH AND PUMPKIN

Insects and diseases, with treatment, as cantaloupe, which see.

TOMATO

Fusarium Wilt	Spraying ineffective.	Develop resistant strains. Sterilize soil (in green houses).	
Anthracnose		Keep plants up from ground.	
Blossom End Rot	Caused by lack of moisture or excessive moisture.	Strike a proper balance and cultivate properly.	
Early Blight Late Blight Leaf Spot	Bordeaux.	As for blight on potatoes, which see.	

General instructions on making up and using the various sprays:

The use of fungicidal sprays in disease control is preventive. An insecticide or poison is often added to these sprays to control certain insects as well, all with one application. Either the fungicide or insecticide, however, may be omitted in a hitherto combination spray when either fungi or insects are absent.

The operation of spraying in itself demands care and thoroughness. A good outfit is absolutely necessary. It does not pay in the end to get cheap hose or nozzle. Use high pressure. Two hundred pounds is preferable. An even coating

of spray material must be put on parts of the plant needing protection. Do not sacrifice spray material to economy, but on the other hand do not drench the plants till the material drips off, except in dormant spraying.

Unless otherwise noted the strength of spray material is that given in the directions for preparation which follow:

1. Bordeaux Mixture.
Copper sulfate (bluestone), 4 lbs.
Lime (best grade stone lime, not slaked), 4 lbs.
Water to make 50 gallons of solution.
Using only wooden (or earthen) vessels.

Continued on page 14

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Remarks

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"WE use Goodyear Pneumatic Cord Truck Tires in much the same kind of service as many farmers. These tires give us mileages up to twenty-three thousand. They effect important savings in delivery time, truck repairs and depreciation and in gasoline and oil. We believe pneumatics the correct type for country service."—Mr. P. E. Dustin, Delivery Department, Germain Seed & Plant Company, Los Angeles.

THE completely successful rural hauling experience of Mr. Dustin offers some particularly interesting facts and figures for fruit growers.

Formerly Mr. Dustin's driver required 8 hours to make his daily run, averaging 75 miles, on solid tires, but now he finishes it in 5 hours on Goodyear Pneumatic Cord Truck Tires.

And the gentle cushioning effect of the latter has stopped the dam-

aging of delicate plants, once caused by the jarring on solid tires.

This cushioning also has decreased truck maintenance two-thirds while the traction of the Goodyear Cords has enabled the truck, carrying full 2-ton loads, to ford streams and plow through slippery sand and mud.

In addition, the husky farm pneumatics have reduced gasoline and oil consumption and given a

total mileage thus far, for four tires, of 48,000.

In reviewing this testimony on these pioneer Goodyear Pneumatic Cord Truck Tires, we are reminded that in nine months after this type of tire was introduced into Florida, the number of pneumatic-tired motor trucks used by fruit growers there, increased from one hundred to more than five hundred.

The Goodyear Tire & Rubber Company
Akron, Ohio

GOODYEAR
AKRON

CORONA DRY

The Universal Insecticide

"The Package Behind the Pack"

FANCY FRUIT sells on sight at prices that build bank accounts for the growers. Wormy, low-grade fruit sells slow at any price—seldom pays the cost of marketing.

For clean fruit, you must spray with the right materials. The poison must be full strength and distributed evenly on the trees. That's why many well-known Fruit Growers' Associations have placed huge orders for "CORONA DRY"—*The Universal Insecticide*. They have learned that clean fruit and healthy trees result from making this famous, powdered arsenate of lead *"the package behind the pack."* "Corona Dry" has been used and endorsed by leading orchardists since 1912. The big commercial fruit sections of the country now consume many carloads yearly. You owe it to *your* business to find out why. Your name and address on the coupon will bring full information. Or a postal will do. WRITE TODAY.

CORONA

Calcium Arsenate—Dry
Use it on Your Potatoes



This new product is safer and more economical than Paris Green—does not burn the vines. Save about thirty per cent in cost and get better results. Our circular tells how and why. Write for it today.

CORONA
CHEMICAL CO.
MILWAUKEE, WIS.
Dept. F

CORONA CHEMICAL CO. Dept. F, Milwaukee, Wis.
Gentlemen—Please send me full information concerning Corona Products. I am interested in:
☐ Fruit Growing ☐ Potato Growing

Spray Schedule for Fruits and Vegetables

Continued from page 12

dissolve the bluestone in a few gallons of hot water, adding water to make up 25 gallons. Slake the lime carefully, permitting neither "drowning" or "burning" and after all action has ceased make up to 25 gallons. Pour these dilute solutions together in mixing barrel simultaneously, through strainer, stirring vigorously. Use the same day. Stock solutions of lime and copper sulfate may be made up and kept on hand, in which one pound of lime or copper sulfate respectively will be dissolved to each gallon of solution.

2. Lime Sulfur may be bought as commercial concentrated stock solution, which is used one part to 8 parts of water for winter strength and one part to 40 parts water for summer strength. Where a small amount of spraying is done it is more convenient to buy the commercial material.

3. Large orchardists, however, usually make their own as follows:

Homemade Lime Sulfur. Concentrated Stock Solution. Illinois Formula.
Stone Lime (best grade) 50 pounds.
Sulfur 100 pounds.

Water to make when boiling is done, 66 gallons.

Place in a large kettle about 15 gallons water, bring to boil, dump in the lime, which starts to slake vigorously. Add the sulfur and mix thoroughly, adding hot water as necessary to prevent mixture burning as lime slakes. When lime is slaked and sulfur well mixed add hot water to bring total volume up to a little more than 66 gallons (to allow for evaporation). Boiling is continued for 30-45 minutes, cold water being added if boiling over occurs. Color when finished may vary from orange to chocolate. Test material by taking some out in a dipper, than pouring it back slowly. If no sulfur globules remain, it has cooked enough. Remove from fire at once. A small amount of impurities (sludge) in bottom of kettle does not interfere with use in spraying.

This stock solution will keep through the season. Dilutions are made 1 part to 4 parts water for winter strength spray and 1 part to 19 parts water for summer strength spray.

Other materials such as stomach poisons may be added to aid in control of various plant pests.

4. Self-boiled Lime and Sulfur is used especially for brown rot on peaches, not injuring the tender peach foliage. It is made as follows:

Self-boiled Lime and Sulfur.

Best grade stone lime, 8 lbs.

Fine powdered sulfur, 8 lbs.

Water to make 50 gallons.

While the lime is slaking vigorously add the sulfur gradually. Prevent "burning" or "drowning" of the lime by judicious use of warm water. Stir well. When action subsides add cold water at once to bring mixture up to 50 gallons and use immediately. This is solely a mechanical mixture, differing from other sprays where lime and sulfur are the ingredients.

5. No. 1. Arsenate of Lead (paste), 2 lbs.
No. 2. Arsenate of Lead (powder), 1 lb.
Water, 50 gallons.

It is well to mix up the arsenate into a thin paste by adding a small amount of water before putting in spray barrel.

6. Nicotine Sulfate or "Black Leaf 40." Black Leaf 40, 1 qt. Water, 200 gallons.

7. Corrosive Sublimate.
Corrosive sublimate, 1/2 oz. Water, 4 gallons.

Deadly poison. Do not use metal containers.

THE NEED OF WISE COUNSEL By Mrs. B. F. Wilcoxon, Colorado

Various reasons are given for moving to town. An old man past 60 years said the other day that he was too old to do a day's work on the farm; he thought he would retire to town and take things easy.

Of course it is true that when a man reaches 60 years he is much less able to do a day's work than before. His joints are stiff he gets out of breath when he tries to chase the old cow out of the cornfield, or drive the hogs out of the garden. He tires after a day's plowing and he realizes that he is growing old. But he is not useless on the farm. He has had a lifetime of experience and observation which the young man has not had time to acquire. If the older man will use his head to good

American Fruit Grower

advantage he will find that it is worth more every month to the farm than the work which he could perform in his younger days.

Let him direct while others execute. Farming is fast becoming a business which requires skilled labor. I do not advise readers who are contemplating moving to town not to do so, but it is a step that should be taken only after the most serious and careful consideration. Farming can and should be one of the most dignified, desirable and sought after ways of earning a living. There is too much belief among our people that the prizes of life lie away from the farm.

CONSERVING THE HOME TIMBER LOT

By E. L. Vincent, New York

Since coming on the farm as notary public I have written a good many farm leases, and I do not remember one into which I did not suggest putting this provision: "The party of the second part shall not cut any timber for fuel except from trees that are down or dead or dying." And I believe this ought to be a part of every such agreement. For there is always plenty of such timber wherever there is a piece of wood of any size on the farm.

If it is worth while for the farmer to put this clause in the articles of agreement when he rents his place, surely it is just as much so when it comes to his cutting his own firewood. Dead, down or dying trees ought always to come first. I have made it a practice to go through the woods before beginning the real work of cutting firewood, and marking the trees that come under these heads. A slight chip, or even the bark removed on the outside, will serve as a mark for the woodcutters when they get to work.

Still further to conserve our woods, I do my best when felling trees to let them go down in an open space, so that no saplings or small trees shall be spoiled. Often where this precaution is not taken, a good deal of damage may be done to growing timber. Then, too, the trunks and tops of trees cut down ought always to be worked up to the very tip. It is the practice with some to cut the trunk off just where the big limbs branch out, and never work the top up at all, a most wasteful proceeding.

If we make it a rule when we cut a tree to replace it in the spring with a little one set out in a good location, we may keep our forests always intact. It is not a great deal of work to take up a little tree and replant it, and while it may not reach a size to be used in our lifetime, it will some day be large enough for wood or lumber.

GRUBBING WITH A TRACTOR

By Alfred C. Weed, New York

We have had little experience with this but have just bought an outfit for the purpose. We have something over a thousand peach, pear and apple trees to pull out this year and plan to use the tractor for the purpose. We have purchased 125 feet 1/2 inch, improved plow steel cable, six strands of 19 wires each; with hooks, clamps and one single and one double block pulley, 8 inch, for 1/2 inch wire rope.

With this outfit we can give a four-times pull and expect to walk right away with the peach or pear trees. The tractor would almost pull the peach trees on a straight pull and would take them out by cutting a few roots.

It is probable in Mr. Bloxham's case that a good tractor would take out most of the pines on a straight pull but the cable would require the use of the blocks. I should prefer to do the pulling before the tops were cut off the stumps.

If the trees were cut it might be possible to loosen most of the roots by the use of a "pavement breaking" plow behind a tractor of fifteen to twenty horse power draw-bar pull. This plow has no mold board and is built very strong. With enough power in front of it it will root up a solid city pavement so that it can be taken up with a steam shovel. Plowing the field both ways with this should get most of the roots out of the way. It could then be worked down a little with a harrow and seeded down for a year or two to give the other roots time to rot before the real plowing.

Every fruit grower should have a business office, if it is no more than part of a desk. Here should be kept all records, accounts, orders and reference books.

\$1475

f. o. b. Racine

New
Mitchell
Sixes

Wheelbase 120 inches
Long-stroke Six motor
Cylinders 3 1/4 x 5
Tires 34 x 4

A Completely New Six

Over 100 New Standards—75% More Endurance

The war has enabled us to do in 18 months what we might have spent years to accomplish. The great Mitchell factory was given to truck building. Our engineers and specialists had 18 months to bring out a new Mitchell, built to new standards.

The result is that now we are able to offer our new conception of a lasting Six. There are more than 100 improvements, 50 per cent added strength, 75 per cent more endurance, 25 per cent more economy, and 20 per cent greater beauty and comfort.

It Had to Come

Two years ago we decided, for our part, that the Light Six type should be bettered. It had been too light. Experience had shown that the boasted over-strength was too often under-strength.

Fierce price competition had forced makers to skimp. Then ideas were changing. Buyers bought their cars to keep, and they looked for many years of service.

The Mitchell was great and successful. In 14 years it had won a world-wide fame. But we knew that all Light Sixes, including the Mitchell, must adopt new standards to meet new-day expectations. And we started then to make our preparations.

New Specialists

We added to the Mitchell staff many new specialists. These were men who had made their mark in high-grade car construction.

Then came the war, and with it came their unique opportunity. For 18 months, while we built trucks, they worked on this new model.

They made over 100 important improvements. Part by part they added an average of 50 per cent more strength. They spent over \$250,000.00 for new machines and equipment, just to build parts better and to test them better. They created a staff of 135 trained inspectors, to measure and test and insist on perfection.

The result is this new-standard Mitchell, combining 100 of the greatest advances that ever were made in Sixes.

New From End to End

The design is new, the color and the top. The radiator is larger, and the wheels, with 34 x 4-inch tires.

The steel frame is deeper, adding 50 per cent to the strength. Rear axle strength is increased 50 per cent, brake efficiency 75 per cent. The gears are 25 per cent stronger by actual crushing test.

There is a new-type disc clutch. There are 123 drop forgings. Chrome-Vanadium and Chrome-Nickel steels are lavishly used in construction.

The ball-bearing steering gear is made 10 per cent stronger. Our new crank shafts show a tensile strength of 150,000 pounds per square inch. They are perfectly balanced on two costly machines.

Gasoline Saving 25%

Gasoline and oil cost is reduced 25 per cent. This largely comes through the use of a thermostat to regulate the water system. It controls the temperature of the air, liquids and gases. The carburetor intake is twice better heated, so the gasoline is vaporized and combustion is complete.

To make staunch bodies we use frame material costing twice the usual. We use interlaced hair in the upholstery. We use four coats of varnish, instead of the usual two, to double the life of our finish.

We give ample room with a 120-inch wheelbase. Compare that with other 5-passenger Sixes.

But one part could not be bettered—our long cantilever rear springs. Out of 40,000 now in use, not a spring has broken. And they have made the Mitchell the easiest-riding car in its class.

Undersells All Rivals

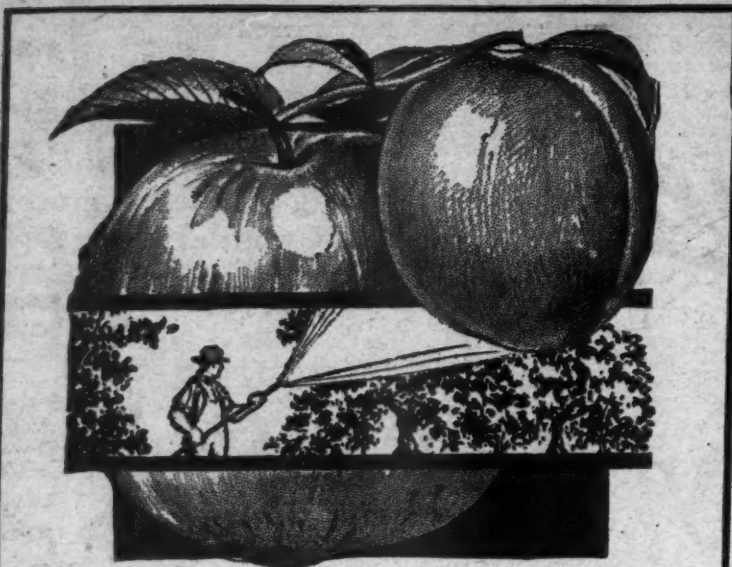
This new Mitchell, despite all these new standards, still sells below all comparable cars. That is due to our wonderful factory efficiency which has made the Mitchell plant famous. We build the complete car—chassis and body—under scientific methods, which reduce labor cost to the minimum.

Write us for further details. Then go over this new car, part by part, with your nearest Mitchell dealer. When you know this car, you will want this new strength, new endurance, new beauty, new economy.

Mitchell E-40

Price, \$1,475, f. o. b. Racine
Wheelbase, 120 inches, 40 horsepower
Six-Cylinder Motor
Cylinders 3 1/4 x 5. Tires, 34 x 4
3-Passenger Roadster, same price
We also make a Touring Sedan

MITCHELL MOTORS COMPANY, INC., RACINE, WISCONSIN



This Fruit Grower Gets 90% Perfect Apples

The 1918 apple crop of a New York orchardist was 16,000 barrels. He sprayed with Orchard Brand Spray materials and his apples were 90% perfect.

GRANDFATHER was willing to bite around a worm hole, but consumers today are not. There is no market for gnarly, worm eaten fruit.

Orchard Brand Arsenate of Lead is a standardized product which is highly efficient in controlling the codling moth, bud moth, apple and plum curculio, canker worms and other foliage chewing insects.

Fruit growers very generally prefer the dry or powdered form because it is light and fluffy and can be more accurately weighed out than the paste form.

The standardized Orchard Brand Bordeaux Mixture, Bordeaux-Lead and Zinc-Bordeaux, each manufactured in dry and in paste form, have a large use in spraying operations. For spraying potatoes no other preparation possesses so many advantages as Orchard Brand Arsenate of Zinc. For dusting potatoes Orchard Brand Lazal is the approved remedy.

The control of insects and fungous diseases is strictly a chemical matter. Right spray materials in right proportions must be used at the right time. Do you need advice? We maintain a Special Service Department, open to fruit growers everywhere. We welcome and answer inquiries promptly, without charge. If you have a spraying problem, address

General Chemical Co.
Insecticide Dept., 25 Broad St., New York

Orchard Brand
Spray Materials

A complete line of standardized insecticides and fungicides manufactured by the largest chemical company in America.

MYERS Power Spray Gun

Equip your Power Spray Rig with a Myers Spray Gun, and save time, labor and material. With it one man does the spraying and the entire capacity of rig is utilized. A single shot to a tree is often sufficient. One-third turn of handle adjusts the Myers Gun from a broad fan-like spray to a long one for high trees. Gun is provided with three discs—4, 6 and 8 gallons capacity—adapting it for use with any power pump. Help is scarce—time is money. Do your spraying single handed next spring by using this modern and simplified one man spraying device—the Myers Spray Gun. Circular and information gladly furnished. Ask our dealer or write us.

F.E. MYERS & BRO.
No. 150 Orange St. Ashland, Ohio.

Kindly Mention American Fruit Grower when writing to advertisers

Raspberries in Matted Row

By E. J. Justin, Minnesota

WHILE there are two distinct commercial varieties of raspberries, namely, the red and the black, I shall confine myself to the red raspberry, and to fundamentals on the successful growing of this delicious fruit.

The red raspberry in the wild state is usually found growing at high altitudes, and it seems to thrive best in a soil of glacial drift formation. Some varieties thrive best in a sandy soil of this description, while other varieties do better in a clay loam. This tendency of the red raspberry in the wild state to grow at high altitudes, teaches us that planting in low, sour, cold soils, poorly drained, both as to air and water (be the soil ever so rich) should be avoided. Generally speaking land on which apple trees thrive is suitable for the raspberry, and it serves splendidly as a filler between rows of apple trees in a young orchard.

The preparation of the soil is also of the first importance. Sod spells failure in berry growing, and it is a lamentable fact that it is not an uncommon sight to see berry plants growing in sod. Where soddy soil is intended for berry culture, one or two season's tillage in a hoed crop, such as potatoes or corn, should, if properly tilled, rid the land of sod.

There are two general methods of cultivating the red raspberry, namely, the hill and the matted row system. Where the land is fairly level and a commercial plantation is intended, rows should be laid out from five to five feet six inches apart, and the plants set two feet six inches apart in the rows. This will enable cultivation in two directions for the first two seasons, after which the plants should be allowed to grow into a matted row.

When selecting plants order one year old sprouts from a responsible nurseryman, who guarantees that the plants are free from disease and of his own growing. A most serious mistake is often made by procuring plants from your neighbors, as they are very liable to be infected with one or more fungous diseases.

How to Plant

As to the method of planting, I have found that the spade or round nose shovel, same as in planting strawberries, is very satisfactory. It is customary with us to use two plants at each setting; care should be taken, however, that the roots do not touch each other. This can be avoided by setting the plants about three inches apart. The reason for doubling up the plants in this way is to insure a perfect stand and also to bring forth a large number of sprouts the first season.

There is quite a difference of opinion among growers as to the width of the matted rows and the amount of thinning to give best results. While it is necessary to have canes in order to grow fruit, it has been my observation that the majority of growers do not thin out sufficiently. The red raspberry, being of a weedy nature, is with difficulty kept within bounds. This is especially true during the early life of the plantation. I should say that up to the fourth season, if the rows or hedges are not allowed to exceed ten inches in width, very seldom thinning is required in the rows. After the fourth season where no fertilizers are used there will be fewer canes, and the rows may be allowed to grow wider but not to exceed twelve inches. This keeping of the rows to a proper width brings us to the subject of cultivation.

During the early and late spring, while shoots are appearing between the rows, constant cultivation is very necessary. This cultivation must be carried close up to the hedge on both sides. The first cultivation in the spring, in place of plowing between the rows, I use a fourteen tooth cultivator which is set about sixteen inches wide. This width is cultivated in the center of the space between the rows passing over the same ground two or three times until a depth of from three and a half to four inches is stirred up. This enables the tender young feed roots to develop rapidly through this loose earth, while the main roots near the canes are uninjured. Following this cultivation I use a shovel cultivator a few times until the sprouts are subdued, after which all cultivating is done with the fourteen tooth cultivator. None of these later cultivations stir the surface to a greater depth than two inches.

Number of Cultivations

The number of cultivations will depend on the number of rainfalls, and the condition of the soil, as the object in view is to maintain a dust mulch at all times.

In addition to the cultivations, the hedges must be hoed at least once during the season, this to be done in the spring before the shoots make their appearance. This hoeing is of the greatest importance, the soil must be stirred to the depth of an inch and left in its place to form a mulch. A hoe four inches wide should be used for this purpose.

As soon as convenient after the fruit has been gathered, the old canes should be removed. Care must be taken to cut them as close to the ground as possible. This is also the proper time to remove any weak or diseased canes, or to thin out where the canes are too thick in the hedges.

To induce the formation of fruiting canes for the following season we prune the tips of the red raspberry in the spring and the amount of the pruning is determined to a large extent by the age of the plantation; it also, by throwing the top and roots out of balance, gives stronger sprouts and larger fruit.

It is considered necessary to support the canes, and the means generally employed for this purpose is a single wire trellis on each side of the hedge, with posts supporting the wire at intervals. While this method serves its purpose fairly well there are some objectionable features. The wires interfere with hoeing and removing the old canes, but to us the most serious objection is the unsightly posts which mar the beauty of the field. I have practiced tying the canes together in bunches of from six to ten canes, and this has proven very satisfactory.

In closing allow me to touch upon insects and diseases. For the raspberry worm use a high pressure spray of full strength arsenate of lead just as the upper leaves have fully unfolded; for cane blight a fifteen to one dormant spray of lime-sulphur in the early spring as the buds are showing; for other fungous diseases a full strength bordeaux mixture.

*An address before the Missouri Horticultural Society.

INFERIOR FRUIT IS A LOSING PROPOSITION

By C. H. Heard, Iowa

The Fruit Grower Loses

1. It costs almost as much to grow inferior as it does to grow first class fruit.
2. It costs more to sort and grade.
3. Its presence in a package always hurts and often hinders the sale.
4. The best trade will not buy it.
5. The grower loses his ideals.

The Fruit Buyer Loses

1. It takes superior products to business.
2. Speculating in inferior fruit is doubly risky.
3. Inferior fruit will not stand up in storage.
4. Rotten fruit is not saleable.

The Ultimate Consumer Loses

1. He does not get what he pays for—good fruit.
2. Damaged fruit is injurious to health.
3. Inferior fruit lessens consumption.
4. The consumer loses faith and buys substitutes. This injures the grower, worker, broker, wholesaler, jobber, retailer and often the consumer.

GROW GOOD FRUIT.

HANDLE IT CAREFULLY.

PUT IT IN ATTRACTIVE YET SERVICEABLE PACKAGES.
DELIVER IT TO THE CONSUMER IN GOOD CONDITION.

APPLES ON FEBRUARY 1, 1919

The monthly of the Bureau of Market Department of Agriculture, shows storage of apples on February 1, 1919, as follows: The 544 storages that reported showed total stocks of 1,626,713 barrels and 4,143,342 boxes of apples. The 534 storages that reported for February 1, this year and last, show present holdings of 1,623,357 barrels and 4,064,469 boxes compared with 2,226,324 barrels and 5,191,876 boxes last year, a decrease of 602,967 barrels and 1,127,407 boxes, or a total decrease of the equivalent of 978,374 barrels or 24.7 per cent.

Address Dept. 82.

A Better Spray

YOU, as a fruit grower, have a bigger task than ever on hand this year. You must grow more fruit to meet the increased demand.

To do this you must safeguard your crop in every way possible. One sure way is by properly spraying with Dow Magnesium Arsenate.

Our experiments, embracing not only laboratory but orchard and field tests, have proven that Dow Magnesium Arsenate adheres better to foliage, remains in suspension in water longer, spreads more evenly, is much lighter and fluffier, and, therefore, it is reasonable to expect much better results than from Arsenate of Lead.

Dow Magnesium Arsenate

is lower in price. Every test goes to prove that it is the ultimate agricultural poison.

Dow dealers are prepared to supply this material. Where we do not have dealers we will ship this product direct in lots of 100 pounds or more. Dow Magnesium Arsenate is packed in the following sized containers:

200-pound drums
100-pound drums
50-pound drums
25-pound drums

See our nearest dealer or write us today.

The Dow Chemical Company
Midland, Michigan

**At A
Lower
Cost**

TOWNSEND

will save his customers \$30,000.00 to \$40,000.00 cash this year or from \$1.00 to \$10.00 on each 1,000 plants, HOW?
GET OUR 20th CENTURY STRAWBERRY BOOK, IT'S FREE



Big Joe, our favorite late Strawberry, most profitable late berry ever grown. A universal favorite

OUR Plants are grown in the garden spot of the world, "THE EASTERN SHO" of Md., where the soil and climate is right. The roots grow here all winter—the tops are dormant, from November to April. This puts hardiness in the plants that can be put there in no other way. Plants grown in the North can not compete with ours for Hardiness, or Productiveness, as our plants have more time to build up the strong, vigorous system. We can ship any time from November until May 15th.

Aroma (late)
Bedwood
BIG JOE
Climax
Chesapeake
Campbell's Ey
DR. BURRILL
DUNLAP
Early Ozark
Early Woodrow
FENDALL
Glen Mary
Haverland
Klondyke
Missionary
Revastico
Sample
Kellogg Prize
WM. BELT

Compare our prices with other catalogues that you have and if we can make you the saving we claim let us have your order. We are financially responsible for our contracts—and our Guarantee goes with every shipment. Have your Banker, Postmaster or any Commercial Agency look us up.

Plants may be ordered direct from this advertisement—prices quoted are F. O. B. Salisbury, Md. By Express, add 25c per 100 plants if wanted by mail. All orders should reach us at the earliest date possible. Full amount of remittance should accompany all orders. Receipt mailed the day your order is received. You will also be notified by card day plants are shipped.

	100	250	1000	5000	50 plants at 100 rate	500 at 1000 rate
FENDALL	\$0.90	\$1.75	\$5.00	\$23.75		
Prices of Everbearing Strawberries						
Progressive	-	-	\$1.50	\$3.00	1000	\$10.00
Superb	-	-	1.50	3.00	1000	10.00
Peerless	-	-	1.50	3.00	1000	10.00
The Newest Everbearing Strawberries						
Lucky Boy	12	25	100	1000		
Lucky Strike	\$3.00	\$5.00	\$10.00	\$50.00		
	5.00	7.50	25.00			

Special prices on new standard varieties that have been thoroughly tested by growers in nearly all sections and the state experiment stations.

BALTIMORE
FORD
Big Late
World's Wonder
CHESTER
Minnesota No. 3

Late perfect flowering varieties.
Midseason, wonderful, productive.

Please give second choice, or state if we shall substitute using our best judgment. Make all money orders or checks payable to E. W. TOWNSEND & SON, Post Office, Salisbury, Maryland.

Kindly Mention American Fruit Grower when writing to Advertisers

Bringing Back Old Orchards

By M. D. Underwood, Illinois

MANY of the older farms have one or more old orchards on them. These are often barren and turned into calf pastures or hog yards. It is well to take time to find out what can be done with them in the line of the original purpose of fruit production. Thousands of apple trees look more like forest trees than fruit producers. Thousands of others are diseased, full of dead limbs and infested with the apple worm and aphids and with the spores of rot and scab.

It is a discouraging job to attempt to bring such trees into a state of production. Some of them though would surprise us by the fruit they would bear if pruned, cleaned up and given a fair chance for their work. This can hardly be done in one year, as a too violent thinning out of the tops will only result in a very heavy new wood growth the following summer. Pruning should have been done when the trees were young, but that is not a matter to be considered just here. It is reviving old fruit trees.

Make a Close Cut

The pruning is better accomplished by degrees, and not all attempted in one season. In the case of the old trees large wounds will be made, and it is important that these be made properly. By this I mean that the cut ought to be made close to the trunk or the limb, and parallel to the part remaining. This sometimes makes a larger wound, but it will heal more rapidly than a smaller wound made the other way and which leaves a stub.

The surface of the cut should be left smooth and no splitting off or bark-tearing permitted. This can be prevented by using sharp tools and making a cut on the underside first, a trifle closer to the main branch than the cut made on the upper side. Some very careful men will saw off the limb a few inches from the tree or main branch, then saw off the stub afterward, but this doubles the work and is not necessary where care is taken, as it should be, with the first cut.

An Axe Should Never Be Used

Rough, torn, split and splintered wounds heal slowly, with the chance of decay setting in being greater. Also insect hiding places and fungus spreading points are formed unless a smooth, neat job is done. The knife for small dead twigs and water sprouts, the shears for larger branches, and the saw for still larger limbs are the tools to use. All large wounds should be covered with wax, pine tar or thick white lead. The last named is the easiest to apply of any material used for the purpose.

What to Prune

Where small branches are merely cut back to encourage the growth of lateral twigs, the cut should be made back to some bud. The new growth from that bud will then start out practically from the end of the branch and not leave an unsightly stub to die and rot off. Old neglected trees often have tops which look like brush heaps, and these should be opened up to some extent each year to gradually let more light into the head, and to bring the fruit-bearing branches nearer to earth, where apples are of more use than they will be up among the clouds.

Take out dead and diseased wood first, then work at dense growth and interfering branches with an eye to heading back and gradually shaping the tree. This work cannot all be done in any one year, but can be gradually brought to a state of order and system.

Grafting, Cleaning and Spraying

If there are certain trees which seem hardy and healthy, but which are of poor variety, they may be made to support the grafted scions of other more choice varieties. There is some fascination about grafting fruit trees and anyone can learn by a little practice and take much pleasure in the work.

Besides the tree-working there is a certain amount of cleaning up to do around the old orchard. No old brush or weeds should be left to harbor insects or fungi. This is one reason for the cutting out of all dead limbs. Search made on bark and twigs will also be likely to disclose the black eggs from which leaf lice are hatched, or possibly some of the oyster shell or San Jose scale may be found.

This will remind us that spraying time

is near. Washes and sprays are as necessary as pruning. Altogether there is a lot of work needed in a fruit orchard every season, but most of us have found by hard experience that there is work connected with all branches of all good and profitable business. The work expended in keeping an orchard in bearing condition is about as profitable as any, whether in a small home orchard or in one that covers many acres.

GROWING CURRANTS

By M. D. Underwood, Illinois

The currant is not as generally grown as it should be. For jam and jelly currants are more in demand than any other small fruit and, when properly handled, there is easy money in growing them. Early in the season is when this fruit gets its growth and, unlike most other fruits, it requires very early cultivation and after the fruit is set not much if any culture is needed. I believe there is nothing that will excel unleached wood ashes for home fertilization. Thoroughly rotted stable manure is good for this purpose but, because of the abundance of noxious weed and grass seed it contains, ceaseless vigilance is necessary to keep them from growing among the stems or canes. Intense early cultivation in addition to about 500 pounds of wood ashes per acre, broadcast and cultivated in early in the spring, will result in the canes being literally bent down with the finest of fruit.

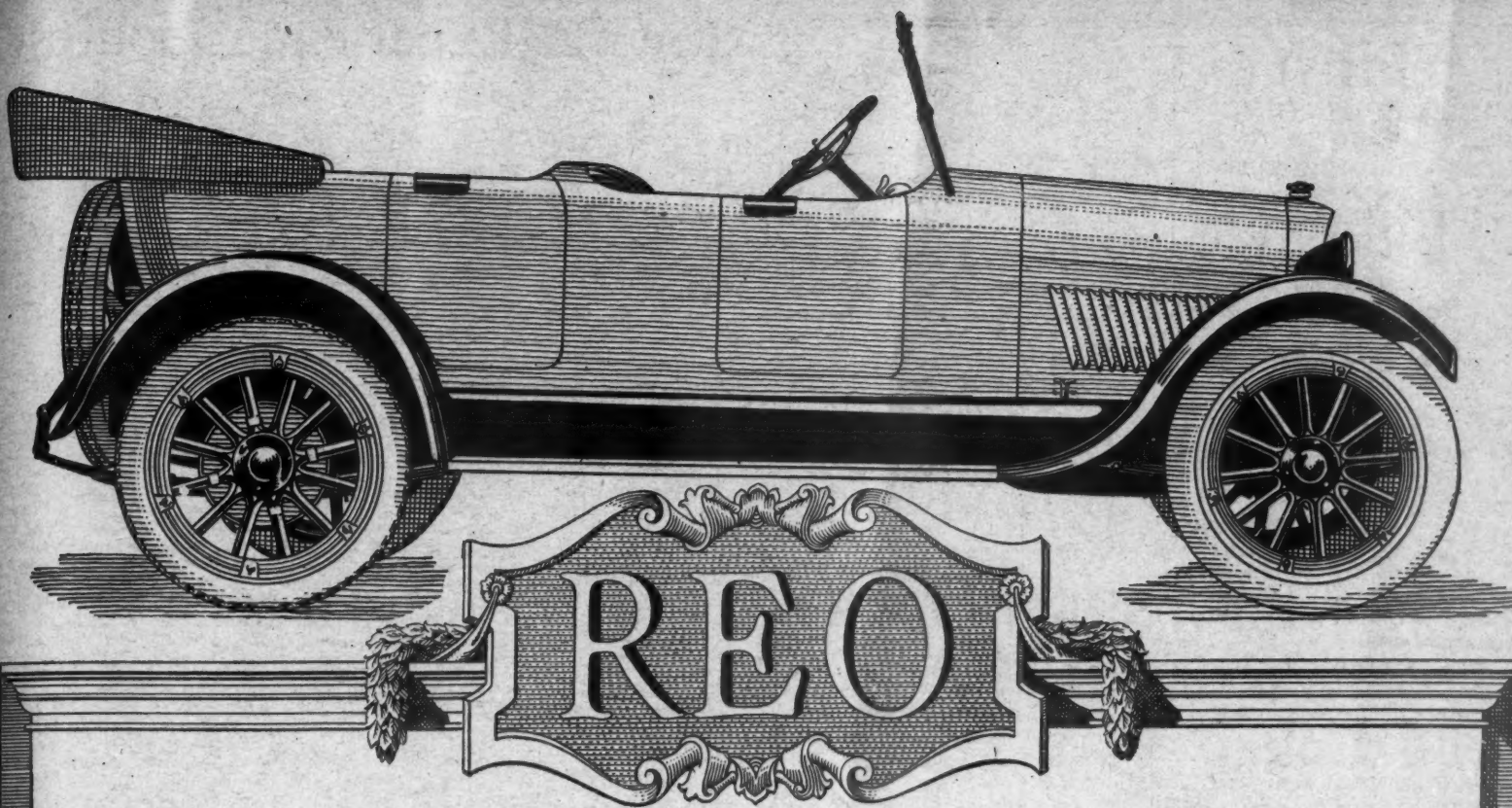
In cultivating currants it is best never to go deep near the bushes because the feeder roots occupy a position near the surface. In clean soil I think no implement is better than a small, one-horse cultivator to stir the ground between the rows. By making rows eight feet apart with the plants three to four feet apart in the row, leaving from eight to twelve canes to each hill, these distances under good clean culture on good soil will allow the plants to fill completely the long way of the row, and to crowd to within two or three feet the other way.

Three Fine Varieties

I believe there are no better varieties than the Red Cross, White Victoria and Fays Prolific. The latter is a large berry, as large as small cherries, of a dark clear red color, sparkling, with few seeds for its size and of excellent flavor, but I consider it no berry for a careless person to grow for it must have rich soil and the best of attention to be a money maker. The Red Cross is almost as large as Fays Prolific, is not quite as well flavored, but under ordinary good culture it yields abundantly and stands shipment well. It is one of the best sorts for market purposes. The White Victoria is a white, clear, transparent currant and under good culture attains the size of the Cherry Currant but is longer and larger in bunch. It is a very heavy yielder.

Except some black varieties of not much account, all currants are acid by nature, but the Victoria when well ripened comes the nearest to being sweet of any other kinds of good currants I have ever eaten. They always sell at a fancy price. Currants like grapes can be propagated easily. Late in the fall, simply cut about ten inch lengths from the good sound tips of canes and bury these in bundles of a dozen, except the tip ends, in moist sand in a box and put the box in a dark, dry place during the winter. In the spring when the soil is in good condition to work well these will be found to have rooted and will grow well when planted properly. Grapes can be layered and so can currants for new growth.

Like all other fruits, currants have their enemies the most troublesome of which is the currant worm. A good remedy is one teaspoonful of paris green to two gallons of water. When thoroughly mixed and applied with a sprayer it completely destroys the worms and does not injure the foliage, but the solution must not be made stronger. After the currants begin turning ripe the mixture must not be used, in fact it is better not to use it after the fruit is half grown. Arsenate of lead may be used but, as it sticks to the fruit somewhat freely, there are apt to be traces of it on berries when they are harvested. On the other hand paris green readily washes off after a shower.



This Is March!—And History Repeats Itself

SPRING IS ALREADY HERE! We are a little late with our regular annual hurry-up message.

ALWAYS AT THIS PERIOD we find it necessary to warn tardy or indecisive buyers that only those who place their orders early—which means at once—can hope to get Reos for Spring delivery.

REALLY, WE MIGHT save the trouble of writing a new advertisement each year—the same copy would fit just as well one year as another.

THE SAME STORY might be told in the same way—so consistent and so persistent is the year-after-year demand for Reos.

FOR, NEVER SINCE THE DAY the first Reo left the Lansing factory and went into the hands of its delighted owner—never since that time has it been possible to make enough automobiles to supply all who wanted Reos.

ORDINARILY—and to a normal degree—that is from the factory standpoint, an ideal condition.

BUT IN MARCH of each year the condition becomes aggravated by an excessive over-demand that is at times discouraging to say the least.

CERTAINLY WE COULD build twice or four times—or ten times—as many Reos per annum as we do.

BUT THE REO POLICY has never been to build the most automobiles—only the best.

WE MAKE ONLY AS MANY Reos as we can make and make every Reo as good as the best Reo that ever came out of the factory.

THAT'S THE REASON for the tremendous demand that always exists for Reos. Reo quality—Reo low upkeep—due to a strict adherence to that Reo policy.

REO IS FIRST CHOICE of discriminating buyers. That's the kind of folk for whom we design and build Reos.

THEY ARE THE KIND of buyers a manufacturer and a dealer appreciates and therefore most dislikes to disappoint or to offer substitutes.

AND WHILE OCCASIONALLY a dealer who also handles some other line will try to sell a customer his Second Choice, because he can't get enough Reos to supply his local demand, never really likes to do so.

ALL DEALERS PREFER to sell Reos—because they stay sold. And every Reo sold sells several more.

THEN THERE ARE the repeat orders from present Reo owners.

ALWAYS THESE HAVE constituted a large percentage of the Reo demand. They are getting to be a larger percentage from year to year because of the larger number of Reos that have been many years in service. Longer than any other comparable car.

OF COURSE a Reo owner always wants another Reo—the percentage of re-sales to Reo owners is amazing and a matter of which we are most proud.

TO ALL SUCH, THEN, we issue the usual March warning—see your Reo dealer at once and place your order.

MAKE IT DEFINITE by paying him a deposit and specifying a date for delivery. Else he cannot, in fairness to other buyers, reserve a Reo for you.

THEN REST SECURE in the knowledge that you will be one of the "lucky ones" to get a Reo this season.

THERE WON'T BE—cannot be made—enough to go round. That is now as certain as the same thing always has been certain in all previous years since the inception of Reo.

SO DON'T DELAY. Decide now. Order at once.

TODAY won't be a minute too soon.

Reo Motor Car Company, Lansing, Michigan

" THE GOLD STANDARD OF VALUES "

SPRAY
FASTER-EASIER-CHEAPER-BETTER
SAVE
MEN-MATERIAL-MUSCLE-MONEY
WITH THE
"FRIEND" SPRAY GUN
PATENTED
THE ORIGINAL SPRAY GUN



Price \$10.00
Thousands of "Friend" Spray Guns were sold before any other Spray Gun was ever made

Mr. Fruit Grower: Here are two things you need—

Mr. Dealer: Here are two things you can sell:

"FRIEND"
New System
SPRAYERS
and
SPRAY GUNS

They are better and once sold they stay sold

A well-known man writes from Alabama: "I am sure you will be glad to know that we are greatly delighted with your Spray Gun, which we are using in our Ohio orchard with the "Friend" Hillside Queen Sprayer, which we purchased eight years ago, and which is still doing the same good work that it did the first year."

IF THERE IS NO "FRIEND" DEALER IN YOUR TOWN APPLY AT ONCE



The Wonderful "Friend" Spray Gun Shut Off
Don't try to spray again without a "Friend" gun.

Price, each, postpaid, \$10.00. Dealers Wanted

"FRIEND" POWER SPRAYER

Read again the above letter from Alabama. It's the opinion of "Friend" users everywhere.

"Friend" Power Sprayers are better because they are low down, they pass under the branches and can't overturn on steep hillsides.

They have the largest sprayer wheels made, thus easy drawing.

The "Friend" motor-pump units maintain a strong, uniform pressure and operate smoothly.

Hit and miss type engines are not only heavy but nerve racking.

The "Friend" motors are auto type—the kind you like to hear.

These wonderful sprayers are made large, medium and small—hundreds of them each year. See that your next Sprayer is a "Friend."

THE "FRIEND" COMPANY

Your Father read their advertisements of the first power sprayers ever made. Perhaps he bought one—if so, it is likely still in the service.

Each and every Sprayer is numbered and a record kept, so parts can always be supplied.

It matters not where you live, the "Friend" Company have a reputation for square and honest dealing, as well as prompt service, and you can safely place orders for Sprayers and Spray Guns without any risk whatsoever.

The same men who built the first gasoline power Sprayer still run the business and have no other interest than to combine your pleasure with success.

Agents are wanted in every section to distribute "Friend" products.

The season is on—Write Today.

"FRIEND" MFG. CO.
GASPORT, NIAGARA CO., N. Y.

Please name this paper

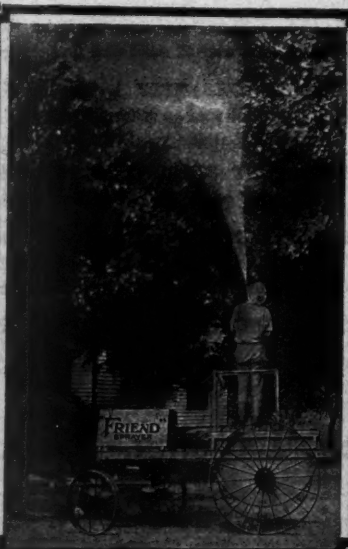
The rubber-tipped plunger covers the tiny hole in the disc—therefore, self-cleaning and no dripping.

The "Friend" gun is the best spray gun on the market.

Large, medium and small discs are furnished, so they can be used on any power sprayer.

They are scientifically designed and mechanically perfect.

Thousands of "Friend" Spray Guns now spray the best fruit in all sections.



You don't need a stepladder for filling and you can turn square around in a fence corner

Engine Experience Contest

By F. N. Farnsworth, Ohio

First Prize Letter—\$10.00

ABOUT ten years ago the gasoline engine made its first appearance upon our farm as the long-looked-for power to drive spraying machine pumps. For many years we had been compelled to use the hand, or "armstrong" method. Then this type was replaced by the sprayer whose pump was driven by the power transmitted from the turning of the rear wheels and finally we sprayed with carbonic acid gas which was purchased in steel drums and as this was released it forced the spray liquid out through the spray hose.

About the year 1908 the Hardie Manufacturing Company put a sprayer upon the market whose pump and agitator were driven by a one-and-one-half horse-power gasoline engine. This engine was vertical, hopper-cooled had dry-cell ignition and was belted to the spray pump. These two outfits of the same style and make did very good service for about four years when the appearance of larger rigs made by the same company induced us to sell the original outfits and to purchase the new ones. The new ones were the "Western Triplex"

depth of one hundred seventy-five feet. This engine, for years supplying both spray water, and water for the stock, is now supplying the stock with water and promises many more years of practical service. The repairs have amounted to somewhat less than a dollar per year for its ten years of service. Its slow uniform running insures long life to the engine.

The service rendered to us on repairs for these five engines made by the same firm has been all that could reasonably be expected. In several instances we broke something on the spray engines about noon. Upon ascertaining the part needed we telephoned the company and the repair was in our mail on the following morning, thus putting the rig in shape for spraying within twenty-four hours from the time of the breakdown. This item of service is an important one, especially in the spraying season. The engines on these rigs were located at the rear of the wagon thus permitting them to be used as portable power by merely backing the spray wagon up to the machine to be operated and throwing the belt onto the engine and the machine.



"Over the Top" With Gasoline Power

each driven by a three-horse-power vertical engine, hopper-cooled, with make-and-break, dry-cell ignition. These, too were belted to the pump which in turn ran the agitator in the tank by means of a drive-chain. In the use of these four engines just mentioned, reliable power was available as a rule. Occasionally the pressure regulator would stick or obstructions in the pumps would cause us to screw down the pressure regulator. This would, in either case throw an undue strain upon the engine and we would sometimes have to pour lubricating oil from the can into the engine hopper to stop the engine's boiling the water below the stop of the cylinder head, when water was not to be had nearby. The spray nozzle can be turned into the hopper and the hopper easily refilled, but we would rather use oil, or even better, get the water than to have the spray chemicals baked onto the interior of the hopper, thereby hindering the future cooling efficiency of the engine. The outfits gave very good service, but like all machinery they worked better when thoroughly understood. The tearing of the cab's side curtains by the limbs exposed the drive-belt more or less to the spray as it blew in. This caused belt slippage, slowing up of pumps, and finally the belt would jump off the pulleys. Another drawback of the belt was the relacing which was frequently required where there were not suitable tools for the work. However the belt furnishes an elastic drive which will yield in case the pumps become clogged or are otherwise prevented from turning.

New Machine in 1909

In the year 1909 we also purchased a three-horse-power engine of the above make and style for pumping water from a

At the same time that these two Hardies were being used, a Novo engine was being used on a Bean sprayer. It was a two-and-one-half horse-power vertical, hopper-cooled engine with jump-spark ignition furnished by dry-cells. This engine was geared to the spray-pump of the three-plunger type operated by eccentrics.

It proved to be very reliable, and in the four years' service which it gave us the repairs were negligible. The engine's crankshaft sets parallel with the frame, the crankshaft gear meshing with the gear on the spray-pump, with considerable reduction, which arrangement makes a very positive and satisfactory drive. The slippage and bother of caring for the belt used in such places, together with the cost of replacing it when worn has, in our experience more than equalled the cost of replacing gears, as they have required no attention other than lubrication. In winter months the Novo was removed from the sprayer by removing four cap-screws and sliding it off the frame of the sprayer, when with the belt-pulley placed where the gear originally was, the engine pumped water all winter for the cattle.

Our Next Experience

Our next engine experience was with the four-cylinder engine on the Friend sprayer. The advantages of the four-cylinder engine over the one-cylinder engine are many, especially where enough volume and pressure are used to demand the ten horsepower to run the pumps. All remember the "chug-chug" of the old one-cylinder automobile; doubtless all of us have ridden on top the tank of our one-cylinder machines where the vibration is very tiresome and becomes annoying. With the rhythmic

Continued on page 22



PAIGE

The Most Beautiful Car in America

Our Prices and Our Policy

The list prices of the Paige five-passenger Six-39 and seven-passenger Six-55 models have been definitely fixed at \$1555 and \$2060 respectively. These prices are based upon the present cost of high grade materials and skilled labor. It is our conviction that there can be no further reduction in motor car prices for many months to come.

As every business man knows, labor is the element which determines the cost of any manufactured product. It is, in final analysis, more than 90% of a production investment. A ton of ore in the ground is worth 75 cents. When it has been mined, transported to the mill, converted into steel, forwarded to the machine shop and fashioned into automobile parts it is worth \$1500. And practically every penny of the enhanced value is a labor charge.

The same thing is true of farm products. The bushel of wheat that formerly sold for ninety cents now brings two dollars and twenty cents, because of the greatly increased cost of production. Until we have cheaper wheat it is idle to think of cheaper flour or bread.

So it is quite evident that the cost of labor must come down before commodity prices can be reduced. Furthermore, it must be a general reduction of the wage scale—a National movement. And the process, as we see it, is going to take a long time.

Both the farmer and skilled mechanic are receiving

greater rewards than ever before. But no men have a better right to fair compensation, and they will undoubtedly continue to receive it. Where, then, can the manufacturer look for a reduction in his manufacturing costs?

As we have said, the list prices of our cars have been definitely fixed. These prices represent intrinsic value—the choicest of manufacturing material and highly skilled workmanship. Without a sacrifice of our own quality standards it would be absolutely impossible to produce such cars for one dollar less.

The point we want to make is this: We could not afford to build and you could not afford to buy on any other than a quality basis. In brief, while we agree that first cost is an important consideration, we are convinced that ultimate cost is vastly more important.

We believe that the only true test of economy is years of hard, gruelling service on the road.

We believe that freedom from repair bills and excessive depreciation is infinitely more desirable than a mere catch-penny list price.

These are our convictions. We have held them staunchly during many fitful periods in the motor car industry. So long as the Paige Company is a factor in the making and distributing of motor cars we shall continue to adhere to them.

The Linwood "Six-39" 5-Passenger—\$1555 f. o. b. Detroit

The Essex "Six-55" 7-Passenger—\$2060 f. o. b. Detroit

PAIGE-DETROIT MOTOR CAR CO., DETROIT, U. S. A.

SATISFIED USERS wrote this Ad for Us-

Their Experience
is worth real
Money to YOU!

I have had several spreaders on my farm, but there are none like yours. I could not farm without it. Last fall I put six acres to wheat, first putting on 30 loads of manure. This spring I put on 20 loads more. You just very good, and it will give 35 bushels per acre. If I had not used the Spreader this spring I am sure I would not have gotten over 15 bushels. Your spreader is one of the best investments you can put on the farm.
C. E. HUPRICH, Ohio.

I would not be without your spreader, because it saves so much labor, puts the manure on the ground evenly, and I can spread any kind of straw or cornstalks. With the proper use of manure on my place and using lime, I have increased the yield of my farm 25% in six years.
E. M. PHILLIPS, Virginia.

Your Spreader has given entire satisfaction. I can recommend it to anyone needing a spreader. It is the lightest draft spreader I ever used. I handled mine in top dressing corn with two horses and I like it fine.
S. A. WUICK, Missouri.

I purchased one of your spreaders eight years ago and it has spread all of my manure from fifty head of stock during that time, and as a labor saver it has easily paid for itself many times over. I believe that any farmer having more than five head of stock cannot afford to be without a manure spreader, unless he is especially fond of spreading manure by hand, which I am not.
C. E. HOUGH, Connecticut.

I have owned three spreaders in my time. The first two I didn't think much of. Then I got one of yours and now I am more than pleased with the spreader proposition. I find by hauling manure in the winter time on clover seed and letting the rain wash it down before plowing it under will increase the crop yield or even wheat. When I used commercial fertilizer and barnyard manure together on 12 acres of wheat last year I got 600 bushels of wheat, an average of 50 bushels per acre. A farmer that owns ten acres can't afford to be without a spreader.
WILL HENSEL, Ohio.

THESE letters answer every question you may have about the New Idea Spreader. We will gladly send you the writers' addresses and copies of similar letters from many others, if you want further proof. These letters, like the New Idea itself, stand every test. They prove that you yourself should have a

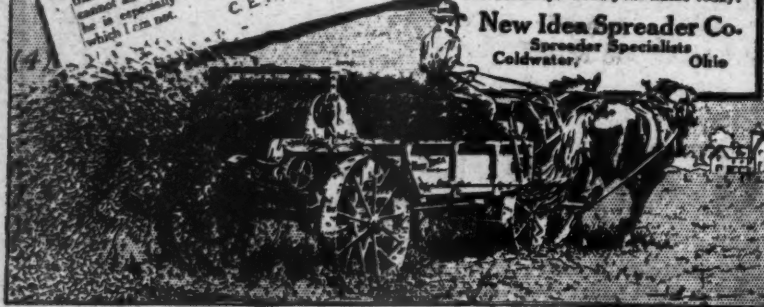
NEW IDEA

Registered U.S. PAT. OFF.

THE ORIGINAL wide spreading spreader that revolutionized old-fashioned methods—that has always been the leader. Has solid bottom with chain conveyors. Pulverizes thoroughly and spreads evenly. Drives with heavy sprockets and chain—no gears. Low down, light draft. Loads and pulls without undue strain on man or team.

When you buy insist on the "New Idea"—the machine you are sure of. If you don't know our dealer, we'll send you his name and a copy of a splendid book on soil fertility. Send your name today.

New Idea Spreader Co.
Spreader Specialists
Coldwater, Ohio



KELLY'S

EVERY FARM
Should Have An Orchard

TREES

The prices are right. The trees are all perfect specimens, and our guarantee is your protection against loss. We offer you a big money-saving and reliable stock. Send for 1919 Free Catalog.
KELLY BROS. WHOLESALE NURSERIES, 700 MAIN ST., DANVILLE N. Y.

Stock Raising in Western Canada

is as profitable as Grain Growing

In Western Canada Grain Growing is a profit maker. Raising Cattle, Sheep and Hogs brings certain success. It's easy to prosper where you can raise 20 to 45 bu. of wheat to the acre and buy on easy terms.

Land at \$15 to \$30 Per Acre
—Good Grazing Land at Much Less.

Railway and Land Co's. are offering unusual inducements to home-seekers to settle in Western Canada and enjoy her prosperity. Loans made for the purchase of stock or other farming requirements can be had at low interest.

The Governments of the Dominion and Provinces of Manitoba, Saskatchewan and Alberta extend every encouragement to the farmer and ranchman.

You can obtain excellent land at low prices on easy terms, and get high prices for your grain, cattle, sheep and hogs—low taxes (none on improvements), good markets and shipping facilities, free schools, churches, splendid climate and sure crops.

For illustrated literature, maps, description of lands for sale in Manitoba, Saskatchewan and Alberta, reduced railroad rates, etc., apply to Superintendent of Immigration, Ottawa, Canada, or

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Canadian Government Agent

WESTERN CANADA
Farm Lands
Low Prices

Engine Experience Contest

Continued from page 20

"purr" of the four-cylinder motor one forgets that there is a gasoline motor working beneath him when he is spraying, and there is no vibration to the sprayer. The engines of these sprayers, of which we have two, are ten horse-power operating a four-plunger pump which delivers twenty gallons per minute from its three-hundred-gallon tank through two spray guns. These motors give very steady pressure at any rate of spraying. They are very accessible for adjustments or removal from the frame when the occasion should warrant. This feature should be looked to in the selection of any engine-driven machine, for practically all of the engines on these machines will need removal, or at least some work done on them during the life of the machine, be it sprayer, truck, or tractor. The engines in these sprayers are easily started, require little attention except an occasional small amount of water as does the auto, and a small amount of cylinder oil. We spray from two thousand to three thousand gallons at two hundred fifty to three hundred pounds pressure with one filling of the three-gallon gasoline tank. Less than ten cents' worth of cylinder oil is required in the same amount of time. One rig has sprayed thirty-six hundred gallons in ten hours, having the supply tank near-by, but the same spraying crew has filled the machine and mixed the spray chemicals. When the spraying season is on we can rush the work if we are equipped for it, especially with the power to apply the spray rapidly at the proper place in a fine mist. The first of these motors had no governor other than the throttle which must be immediately closed as soon as the tank is emptied or the motor will race. The newer engine however has a fly-ball governor which absolutely does away with any unsteadiness once the engine has attained its normal speed. The Dixie high-tension magnet on the first engine gives splendid service, although a little slower in starting the motor when cold than the Atwater Kent system on the new sprayer. The latter ignition system uses dry-cells, but the current flows for such a very short time for each spark that the dry-cell depreciation is reduced to a minimum. The first of the two motors has a circulating pump containing a small safety key in its shaft which will snap before the gears are stripped in case the engine is forced to revolve by hand when it is frozen, or if the water-pump should contain any obstruction. We all try to prevent these occurrences but these safety provisions are well appreciated nevertheless. The second engine has thermo-siphon cooling which is also very satisfactory. There is no radiator on either motor, the water being cooled by flowing through a galvanized tank which is submerged in the spray liquid, none of the spray liquid of course passing through the cooling system. The first engine is the Carson, the second is the Universal.

Stationary Engine Experience

We have found three makes of stationary pumping engines very satisfactory. The water pressure system which supplies the three families of our farm is operated by a one-horse Flint & Walling horizontal, hopper cooled engine with jump-spark ignition supplied by dry-cells. The pump of the same make is run by a belt, pumping water into the pressure tank of one thousand gallons capacity. This tank has been filled on an average of about every five days for the past four years during which time the engine has been out of order for about three days; the repairs averaging about one dollar per year, and the gasoline and oil used for this work amounting to about four dollars per year.

For pumping water with which to spray, and for watering stock we purchased a Waterloo Boy one-and-one-half horse-power, horizontal, hopper cooled engine with make-and-break system furnished by dry-cell ignition. We have used one of these engines for three years and the other for two years with the best of service. The pump-jack is geared to the engine, thus eliminating belt trouble especially where used in the weather as they are. They are very easy to start, regardless of weather conditions, and have compression release to use if desired, and the same release lever gives absolute and instant speed control.

They will pump water for ten consecutive hours on about fifty cents' worth of gasoline and less than ten cents' worth of oil and grease for the gears. They attach to any windmill style pump, one of ours being used as an auxiliary to the windmill for supplying thirty head of cattle. The other runs a working-barrel type of pump such as is used in the oil fields.

This type of pump works very well and should be satisfactory with almost any style of pump-jack. The repairs on these engines have been less than fifty cents each. It has proven a splendid plan to pour a little kerosene onto the valve-stems and the governing levers occasionally to loosen the residue which is liable to collect from constant lubrication on any machinery, especially where exposed to any dust. It is generally considered good practice to give all machinery an occasional kerosene bath provided it does not interfere with any electrical connections, and provided that the kerosene can be drained off or removed. Systematic lubrication must immediately follow this treatment however, as the cleaned surfaces are not lubricated very long by the kerosene, and the oil film must be renewed.

Engine for Apple Grader

Another very satisfactory use for one of the last mentioned engines was running the apple grader. The grader can be turned by hand, but who will do it for fifty or sixty cents per day which represents the cost of operating the engine at this work. The engine makes a splendid "extra hand" at this season of the year when all speed is needed to place the crop under shelter.

Our only air-cooled engine has been a one horse-power, horizontal Aeromotor with make-and-break, dry-cell ignition. This pumped water from a well about twenty feet deep, for about four years. Experience has proven to us that the vertical type engine requires less lubrication than does the horizontal engine, and it will not heat up as quickly as will the horizontal type if the cylinder lubrication fails. The friction resulting from the straight up and down motion in the cylinder walls is not as great on them as it is where they bear the weight of the piston largely as in the horizontal type. This accounts for the need of more oil in the horizontal engine than in the perpendicular type, and is the ground for the theory, and perhaps the truth that the horizontal piston will wear the cylinder slightly oblong in time.

The three years' service of our engine has shown no such result as yet, but further use may reveal it. It sounds reasonable to expect this result. The perpendicular engine is much more compact, thus requiring less floor space, but is generally more inaccessible than the horizontal whose piston is in plain view, showing whether or not the film of oil is being preserved on the piston as it should be.

Tractor-Engine for Corn Sheller

Corn for our eighty head of steers has been shelled in the past by our Waterloo tractor on stormy days. This saves hauling to the mill and returning, besides the saving in time and money by doing the work during days that are unfit for outside work. These inside jobs all help to solve the problem of year-round employment of hired help which will be an incentive for him to stay year after year. A large pile of old stumps of peach-trees which had outlived their usefulness, together with apple-tree fillers waits to be buzzed up with the Fordson, as well as the cornshelling for the seventy-two head of steers which we feed during the winter.

For the past ten years the gasoline engine has proven indispensable to us, first for running the spray-pump, for pumping water, pulling the plow and harrow through the orchard, or preparing feed, and finally, for hauling the finished product to market; in each case showing very satisfactorily its advantage over the previous method of doing its task.

Many makes and types of very reliable engines are on the market at present and with the proper selection of engine for the work to be done, and a reasonable amount of good judgment used in their operation, the use of gasoline or a kerosene engine is a profitable investment.

The use of the engine leaves us free for work which machinery can not accomplish; especially the planning, which can be done more efficiently when relieved of the heaviest work which the gasoline engine is well intended to perform.

Kindly Mention American Fruit Grower when writing to Advertisers

10 Searching Questions About the Maxwell and 10 Frank Answers; Read Them, for They May Decide Your Choice of a Car

Q.—Reduced to one point what is the single greatest thing you can say about the Maxwell?

A.—It is reliable.

Q.—What makes it reliable?

A.—The chassis was designed five years ago to be extremely simple. Then we kept on making and making Maxwells all alike on this chassis year after year until now we have made 300,000 of them. Our policy is to do one thing well and thus obtain perfection.

Q.—Have you changed the original design any?

A.—Not in any single fundamental. We have added an improvement here and there from time to time—but no changes from our original program.

Q.—Have there been any great chassis improvements in the last 5 years?

A.—We believe not. There have been multi-cylinder cars and multi-valve cars; but in a car under \$1000 we do not believe them to be practical.

Q.—How much of the Maxwell car do you build?

A.—We believe that we manufacture more of the parts that go into our car than any other manufacturer.

Q.—Why do you do this—can you

not buy parts from others cheaper than you can build them?

A.—In some cases yes; but not so good as we can build them. In other cases no, for we operate 8 great plants, have an investment that runs into many millions of dollars, carry a tremendous inventory, have a rapid "turn-over" and a large one. Besides, we make parts for cars other than our own including some that cost in excess of \$4000.

Q.—Has the Maxwell every modern equipment?

A.—Yes, even including the carrying of the gas tank in the rear.

Q.—Have you improved the appearance of the Maxwell any?

A.—Yes. We have made a vast improvement in the last few months—so much so that many persons thought we produced a new model. Note the illustration. This is drawn from a photograph without the slightest exaggeration.

Q.—How about parts?

A.—There are \$5,000,000 in parts carried by 2500 Maxwell dealers all over the United States.

Q.—Will you reduce the present price if I buy a Maxwell now?

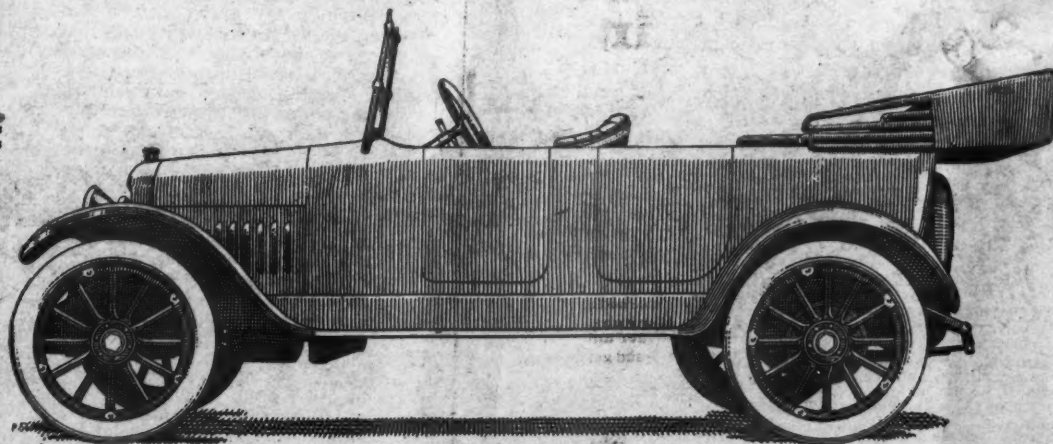
A.—No. The present price is guaranteed until July.

Price \$895 f. o. b. Detroit.

MAXWELL MOTOR COMPANY, Inc., DETROIT



More miles per gallon
More miles on tires





THE DEMING CENTURY—one of three "barrel-type" sprayers in the Deming family and a national prize winner. Submerged cylinder, 4 bolts give access to valves and plunger. A 2-nozzle sprayer for general use.



THE SAMSON is the "big boss" of barrel sprayers—combining a 50-gallon barrel and extra large air chamber tank on a sturdy base. Maintains 150 lbs. pressure and thorough agitation.

Why Run the Risk?

RECORDS prove that fruit and farm crops are notoriously uncertain sources of income. Why increase that risk?

By consistent spraying, avoid the peril of bad years due to bugs, worms, scale and blotch.

Guard against expensive delays in spraying by using Deming time-tested equipment; our 40 years of specialized pump knowledge frees you from the high cost of "experimenting."

Send for the Deming 1919 Catalog. The 16 outfits there illustrated meet every kind of spraying need. The illustrations show you the latest, safest developments in pumps, accessories, nozzles and spray-guns. Gladly sent free on request.

Ten cents (stamps or coin) will bring you 80-page guide book on spraying, spray mixtures and when to spray.

THE DEMING COMPANY

921 DEPOT STREET

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"Finest Apples I Ever Grew"

"The finest apples I have ever grown were sprayed with Pyrox. One year I thought I would save a little in the price, and was talked into trying 'something just as good'; but never again, for the crop that year was far from being as good as when I used Pyrox."—C. H. STOKES, Medford, N. J.

If you want the highest quality fruit, spray with

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"The Spray That Adds to Your Profits"



Pyrox is a smooth, creamy paste which is all ready to use by simply mixing with cold water. It sticks like paint and protects the fruit throughout the growing season. Pyrox is just as good for potatoes, tomatoes, currants, strawberries, etc., as it is for apples.

Get this Pyrox Crop Book. It tells how to protect your crops against bugs, worms and disease. Send for a copy today. A postal card will bring it.

Bowker Insecticide Company

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New York Fruit Growers

By Charles A. Green

ON JANUARY 15th the Western New York Horticultural Society and the New York State Fruit Growers' Association held a joint meeting at Rochester, N. Y., to be continued for three days. New York state has long been known as the Garden of Eden for fruit growing. Here are produced in vast quantities peaches, apples, pears, quinces and the various small fruits such as the grape, raspberry, strawberry, blackberry, currant and gooseberry. At times the capacity of leading railroad lines is taxed to the utmost to provide transportation for fruits grown in western New York, and the same can be said of other sections of the state, particularly of the Hudson River district. As might be expected, the display of fruit at these annual meetings has been remarkable, but this year all records seem to have been broken. I have not seen such an exhibition from one state as has been made here at Rochester during the past few days, and the fruit is of the highest quality and most brilliantly colored, giving evidence of skillful culture and spraying.

Spies Worth Much Money

It was announced that on the afternoon of January 16th a carload of superior apples would be sold at auction. I saw these fruits in barrels with the head removed. The apples appeared to be for the most part Northern Spy apples and they presented a tempting appearance.

I asked a prominent member what price he thought these Spy apples would bring at this auction sale. My expectation is that none will be sold at less than \$10.00 a barrel and that possibly these apples may bring \$15.00 per barrel, and yet they are not claimed to be fancy fruit. The only claim made is that they are strictly New York state A grade, but to many people they would seem to be fancy apples.

A friend who is engaged in the commission business in New York city has told me that if he knew where he could get fancy Spy apples strictly up to grade he could get almost any price he might ask for them, even \$15.00 to \$20.00 per barrel. "But," this man added, "I find it almost impossible to get Spies from any eastern state that are strictly fancy fruit." He said his best Spies heretofore had come from the state of Vermont. The Spy is a noble apple of high quality and beautiful appearance. It originated near the city of Rochester, N. Y. One of its faults is that its skin is tender and will not endure shipment like the Baldwin.

Organization Urged

President J. T. Bush urged farmers to organize in order to get their dues in the way of proper legislation. He classified fruit growing as a branch of farming and urged all present to join an organization such as he suggested. He had visited Washington in the interests of farming and was told there that farmers would never get their just desserts until they were more thoroughly organized. He was in sympathy with the dairymen supplying New York and other large cities. He held that these dairymen were not getting large profits from the sale of their product.

He said the war had made it plain that agriculture is one of the most important industries of the world and therefore in need of a powerful, harmonious association. No one can afford to antagonize the tiller of the soil. His sympathies were with the man on the farm who begins work before daylight and quits only at the approach of darkness.

Extreme Cold Hurts Fruit

Prof. Stuart called attention to the great injury done to fruit trees by the severe cold of last winter, which was the most trying of all winters within the memory of the oldest inhabitant. He said that the injury to fruit trees has not yet been fully developed. His experience was that in the years to come fruit trees might show attacks of fungus or other pests that were brought about by the weakened condition of the trees owing to the severity of the past winter.

A visitor from Michigan stated that nearly all of the peach trees of the great peach growing sections of Michigan were destroyed last winter or severely injured. A visitor from Ohio announced that he could make much the same report for Ohio, where the peach trees were seriously

injured during the winter of 1917-18. The hardiness of varieties was thoroughly tested last winter. In some sections of Canada the Fameuse or Snow apple trees were seriously injured, something heretofore almost unknown, since it is a hardy variety.

For leaf curl he recommended the fall spray of lime-sulphur, one to fifteen. Attention was called to the attack of fungus on cherry trees, which caused the spotted leaf and the early fall of the leaves in late summer or early autumn.

The Hale Peach

Incidentally Prof. Hendricks referred to the new Hale peach as a superior variety. He said it was regrettable that this peach and other promising new fruits should not be thoroughly tested before being offered to the public. If fruit growers had known years ago that the Hale peach was so valuable they might now be reaping rewards which they will not secure for several years from this date.

Prof. Hendricks' particular work is in hybridizing various hardy fruits with the hope and expectation of securing varieties of great value. In testing thousands of varieties of apple, grape or other fruits, he may discard all but a dozen and finally all but three or four, which he may consider of sufficient value to be handed out to prominent fruit growers in different parts of the state for testing. This method was necessary owing to the fact that a variety may succeed remarkably well in one locality and be a partial failure in another locality. This is particularly true of the strawberry.

Luther Burbank was facetiously spoken of by one of the platform men as the P. T. Barnum of horticulture, and yet in some respects Luther Burbank may be called a pioneer and almost a wizard, for Burbank had great intuition. He seemed able to pick out a dozen promising varieties from perhaps 20,000 candidates with almost certainty of success. He did not seem to relish Burbank's commercializing his new creations, but it must be remembered that only salaried men like our leaders at the experiment stations can afford to do business without profit. My opinion is that the men who have done so much for this country in producing new varieties have reaped insufficient rewards and many of them have died in poverty or without proper recognition, as, for instance, Jacob Moore, who gave his life in the pursuit of improved varieties of fruits.

Experiments with Grapes

Prof. Hendricks has found in his numerous experiments that if he comes to the examination of the wood of a new variety of grape which is exceedingly long jointed, that is a long space between the buds, this variety will be prone to produce small clusters, and cannot be of value. If on the other hand the new variety has exceedingly small space between the buds, this also will produce small clusters which are undesirable. He has found that if the new candidate has reflex stamens, that is with stamens turned downward, this variety will not be self-fertilizing and will not bear perfect fruit if planted by itself, whereas the new varieties having upright stamens are inclined to produce varieties that are perfect blooming. With strawberries he has found that pistillate or imperfect blossoming varieties tend to produce their kind, whereas staminate or perfect blooming varieties tend strongly to produce their kind. He says we do not desire to multiply varieties that are not self-fertilizing from their own blossoms.

One hundred and twenty-five years ago there were no successful varieties of grapes in this country. At that early date only foreign varieties were existent here. It was only by crossing foreign varieties with our native wild grape that even moderate success was achieved in grape growing in America. Now we have 2,000 varieties of native grapes or of crosses of natives with foreign blood. It is only a little while ago that we had no improved blackcap raspberries but now we have 40 to 50 improved varieties. New fruits must be tested not only for large size, great beauty and productiveness, but for hardiness, which is absolutely an essential.

He has been securing a variety of pears that will be blight proof. He has thirty

Continued on page 26

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GMC Trucks and Fruit Growers' Profits

The fruit grower who depends upon GMC Trucks as a medium for transporting his product to market brings to the aid of his business many profitable advantages.

The employment of GMC Trucks means more to him than mere increases in speed and capacity.

Rapid transportation, of course, brings the farm closer to the market, and greater capacity makes possible moving the product in greater quantities—both resulting in more economical transportation and greater profit.

But there are still other considerations that mean greater profit: Fruit taken more speedily to market can be delivered either to the consumer or to cold storage in prime condition. This is due in part to the fact that, hauling in large quantities direct from the point of production to consumer or distributor, entails less handling so the fruit arrives comparatively free from bruising.

With a GMC Truck on the job the fruit grower may reach the city market in the early hours of the morning, and thus gain further advantage. All over the country fruit growers have seen these advantages and have put motor trucks on the job.

For this work the wide range of models in the GMC Truck line adapts them admirably for haulage of fruit. There is a GMC Truck model for every demand, and GMC quality to meet every emergency.

There is a 3/4-ton GMC Truck and a 1-ton GMC, both pneumatic tired, that will haul fruit to market at express train speed. There is a 1 1/2-ton GMC, a 2-ton, a 3 1/2-ton and a 5-ton model.

Each is fitted for some one requirement best. To get just the right truck for the work is the first consideration, and returns will take care of themselves.

Ask for a copy of Truck Talk, No. 25.

Following the close of the war, prices on all GMC Trucks were lowered.

Let Your Next Truck Be a GMC

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Tobacco Co.



Toppy red bags, tidy red tins, handsome pound and half pound tin humidors—and that clever, practical pound crystal glass humidor with sponge moistener top that keeps the tobacco in such perfect condition.

YOU can't help getting jimmy pipe or cigarette makin's happy every time you fire up with Prince Albert—it pleases you so fair and square. You just can't get enough hours in the days and nights to put to smoking purposes. That's the situation!

It's never too late to hop the fence into the Prince Albert pleasure-pasture! For, P. A. is ready to give you more tobacco fun than you ever had before. *That's because it has the quality, the flavor and the fragrance!*

Soon as you know Prince Albert you'll say that P. A. *did not* bite your tongue or parch your throat. *And, it never will!* For, our exclusive patented process cuts out bite and parch and lets the man with the touchiest tongue simply smoke his fill all the time.

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Just send me your name and address. I will mail you my big new Gate Book free—postpaid. Gates prices, even then it costs you to build homemade all wood gates. Can't-Sag Gates are the only farm gates that are

GOOD Enough to Use ANYWHERE
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Always hang straight and true. Never sag, drag or warp or twist out of shape. No nails used. No wood joints. Every board double bolted between side angle steel uprights. Self-locking hinges—won't let loose stock—easily repaired—outlast several all wood, steel, wire or pipe gates. Cost less than any other gates you can build or buy. Nearly a million now in use. Write for free Catalog today.

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ROWE MFG. CO., 291 Adams St., Chicago, Ill.

SPRAY—Protect Your Crops Against Insects and Fungous Diseases



The Union Leader
High Pressure
one man machine.
For general spraying.

Double the Yield and Bring Foliage to Full Maturity
High and Constant pressure for thoroughly saturating foliage is the secret of success.

Perfect Agitation keeps poison in thorough solution. Strainer Cleaners to prevent clogged pipes and nozzles are specialties of the "Ospaymo" machines. They stand up under most severe conditions—built for long service.

You can spray Everything with the—Union Leader—and use the engine for other power purposes.

Write for complete catalog

FIELD FORCE PUMP CO., Dept. B, Elmira, N. Y.

Kindly Mention American Fruit Grower when writing to Advertisers

New York Fruit Growers

Continued from page 24

candidates of this class of pears, some of which are like Seckel in many respects but as large as Bartlett. Prof. Hendricks is seeking an early red apple which he claims we have not secured among the older sorts, and yet we have the Red Astrachan, Fanny and several others, but perhaps he does not consider these as early as desired for the coming new red variety.

New York Great Fruit State

Seth J. T. Bush, formerly president, declared that New York was the greatest fruit producing state and that it should lead the whole country in progressiveness and efficiency in fruit growing as well as in farming. Every farmer should get behind the Dairymen's League. If farmers were organized they could fix a price for their products, whereas now others fix the price which the farmer must accept. We welcome government aid but object to government interferences. We stand for efficiency in the state and nation. This society should use its influence to stabilize wages on the farm. Fruit growers pay too high prices for apple barrels and other packages. It may be necessary for fruit growers to co-operate and manufacture barrels and other packages for fruits.

Mr. Rogers claimed that western New York was one of the favored places where apples can be grown to the best advantage and more economically than in other sections. He said that there had been but few apple trees planted in western New York in the last ten years, not enough to take the place of old orchards whose best days are past. Our apple grading law is going to be helpful if enforced. We do not now have to wait twenty-five years for apple orchards to come into fruit-bearing as our fathers did, but are able to get trees into profitable bearing in eight or ten years by low-heading and up-to-date pruning. The time has now come for planting more orchards.

Prof. F. C. Stuart said that one result of the severe winter of 1917-18 might result in the trees being attacked by fungus that otherwise would not have occurred, and by cankers of various kinds and crown rot and root rot. Prof. Hendricks says that much attention is being given to contagious plant diseases. He is hopeful that some time a valuable seedless apple and a seedless pear will be produced.

A Michigan man said that the outlook for the apple growing industry was good and that apples were bringing a better price in Michigan than in New York state. It was claimed that national prohibition would not affect the profits of grape growing.

The new name for the united two societies is the New York Horticultural Society. John Hall, after thirty years of service as secretary and treasurer of the Western New York Horticultural Society, declined to be a candidate for the coming year.

Prof. U. P. Hedrick was elected president, and E. C. Gillette, secretary and treasurer of the combined societies.—*New York Sun.*

FRUIT IN BRITISH COLUMBIA

By John Pawtuckaway

British Columbia's accomplishments and possibilities in fruit growing are almost unknown in the United States, outside of the Pacific states, conditions in which are somewhat similar; yet this Canadian province, whose northern boundary is the Yukon, shipped several thousand cars of fruit in 1918. When present orchard plantings are in bearing, an annual production of 7,000 cars or more is expected.

Some of the British Columbia fruit goes overseas, but the bulk is sold in Alberta, Saskatchewan and Manitoba. On the growth of these grain provinces hinges the future of British Columbia fruit growing, which is capable of tremendous expansion. The principal fruit districts are the Okanagan, Kootenay, Kereemos, Lillooet and Salmon Arm. All these are valley districts, located among mountains, and all are in the semi-arid or arid territory of the southern interior. British Columbia coast country has a heavy production of the small fruits, but the precipitation—4 to 8 times as great as in the dry belt—is found unfavorable for commercial tree fruits, though there are many small orchards. The Okanagan Valley, running north and south for 150 miles, leads in fruit pro-

American Fruit Grower

duction. Fruit growers here have experienced varying vicissitudes. The valley's incomparable climate—it is about the mildest section in Canada—with 10 to 14 inches of annual rainfall and a wealth of sunshine; the splendid scenery and many opportunities for sport in mountain and lake, gave real estate exploiters an easy chance. The Okanagan has been compared to the Italian Tyrol. It is the California of the Dominion. Stone fruits as well as apples flourish, and one district at the south end, Penticton, has a sizeable output of apricots.

Saved by Organizing

It was the fate of the Okanagan to be overboomed. Settlers, many of them without the merest agricultural knowledge, were drawn from all parts of Great Britain and Canada; and one big colonization company, with a branch in Brussels, established a colony of Belgians near Vernon.

Out of the demoralization which inevitably resulted emerged the present stable fruit industry. The Okanagan United Growers, the co-operative association through which a major portion of the valley crop is sold, was organized under provincial legislation five years ago. The central office is at Vernon, at the head of Okanagan Lake, and there are local associations and packing houses at shipping points. The Canadian Pacific Railway operates a rail and boat service through the valley, in addition to which the southern region has access to Vancouver, the largest city in the province, over the Kettle Valley Railroad. In selling its output the Okanagan United Growers employs salesmen on the prairies and at Vancouver. Its apples are widely known by the "O. K." brand which has been extensively advertised in Western Canada.

Small Orchards Usual

British Columbia's principal competitors in fruit selling are the northwestern states, which have always shipped to the Canadian prairies. In growing fruit and marketing local fruit growers have followed the lead of the districts to the south. Thus box packing was adopted. There are several large orchard enterprises—one orchard a mile long is shown visitors—but the average owner handles 5 to 10 acres, well-cared for.

The fruit growers are an intelligent class, and have made full use of the expert horticulturists employed by the government for fieldwork. There has never been any complaint about yields. The most serious mistake made, for which farmers are still paying through the nose, was selection of poor market varieties for planting, and the use of too many varieties.

The provincial department of agriculture has surveyed the fruit districts and now offers a recommended list of best commercial and home varieties. The apple varieties commended as probably most profitable in the Okanagan are McIntosh, Jonathan, Grimes Golden, Wagener and Rome Beauty, with a sixth variety, Northern Spy, valuable in certain localities. In West Kootenay the recommended commercial varieties are McIntosh, Wagener, Northern Spy, Gravenstein and Ontario. Reflecting the influence of rainfall, altitude, prevailing winds, summer heat and soil, there is a great variation in suitable varieties.

Patriotism and Profit

The past year has been a notable one in crop annals, a large crop occurred in combination with high markets, and fruit growers are flush as a consequence. Not only for apples, which is the major crop, but for peaches, plums, pears, cherries and apricots were prices excellent. Business conditions in the fruit districts are the best in several years.

The war has meant much from the start to these Canadian fruit growers. No district in Canada has sent more men to France than the Okanagan, whose proud record of volunteers is 10 per cent of total population. The first effect of the war was severely to depress the prairie market for fruit. The labor problem has steadily grown more difficult. The situation was saved the past season by female help, hundreds of girls donning overalls and with ladders and baskets taking their place in the orchards.

Other girls and women labored in the packing houses. The girl pickers were largely recruited in the cities and general farming sections at the coast, and many squads, properly chaperoned, spent weeks in fruit districts several hundred miles from home.

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for March, 1919

Ohio Horticultural Society

By E. W. Mendenhall, Ohio

The 52d Annual Meeting of the Ohio State Horticultural Society was held Farmers' Week at The Ohio State University, Columbus, O., January 28th and 29th, with a very interesting program. The meeting was called to order by the president, W. G. Farnsworth of Waterville, Ohio. The appointment of certain committees was made, after which the president made a short address, giving the progress of the society and the good obtained from such an organization.

H. A. Gossard, entomologist, Ohio Experiment Station gave an account of a ten year record in a Southeastern apple orchard, from which some interesting data was gathered.

H. P. Gould, pomologist, United States Department of Agriculture, a very well known man and recognized all over the United States as an authority on fruits, read a good paper on: "Some Important Pomological Problems and Their Significance."

A. C. Hottes, of the Department of Horticulture, Ohio State University, read an interesting paper on: "An Appreciation of Flowers."

"Orchard Hygiene," by W. W. Farnsworth, Practical Orchardist, Waterville, Ohio.

H. G. Ingerson, Department of Horticulture, Ohio State University, gave a paper: "Future Status of the Grape Industry." (Soil Improvement Program for Vineyards.)

"Report on Plant Diseases for 1918," by Prof. A. D. Selby, botanist, Ohio Experiment Station, Wooster.

"Winter Injury," by W. H. Chandler of Cornell University, proved to be a very interesting talk, and as Ohio fruit growers suffered heavily one year ago, many questions were asked him, and it made the subject one of much concern.

"Tree Husbandry," by J. S. Houser, entomologist, Ohio Experiment Station, Wooster, was of interest also.

Committee report on "Entomology," by H. A. Gossard, showing what has been done to control insect pests, etc.

W. N. Chandler, gave another good and interesting talk on "Pruning with Relation to Production." This subject, of course, was interesting to all fruit growers, and many questions were asked him regarding his method of pruning.

The meeting closed with the annual business meeting and election of officers as follows:

President, Frame Brown, Columbus; vice-president, H. J. Speaker, Sandusky; secretary, R. B. Cruickshank, Columbus; treasurer, E. J. Hoddy, Linden.

The Ohio Horticultural Society is a strong society, and much interest is manifested in these annual meetings. It is a time when members like to get together and renew their old acquaintance. This is the greatest gathering of the year, and one can always find numbers of his friends there to whom to give and from whom to receive a hearty handshake. The meetings are of value, therefore, both educationally and socially.

GROW YOUR OWN FRUITS AND VEGETABLES

By C. H. Heard, Iowa

Plant a Half-Acre Garden

1. Get good seed.
2. Stick to staple and standard crops.
3. Make succession plantings.
4. Grow early and late varieties.
5. Have long rows.
6. Fertilize and spray.
7. Dry and can your surplus.

Have an Acre Orchard

1. Plant only standard varieties.
2. Consult successful growers.
3. Grow apples, peaches, plums, cherries, grapes and berries.
4. Plant for succession of ripe fruit throughout the season.
5. Give plants plenty of room.
6. Prune, spray, cultivate and fertilize.
7. Dry and can your surplus.

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SPRAY your orchard now with the same machine that you will need later for spraying potatoes, strawberries and other row crops. With it you can "top-spray" six to ten rows of potatoes at a time or "drop-bar" spray for blight later in the season as shown below. Furthermore, take the engine off your Iron Age Sprayer and put it on your potato digger when harvest time comes.

Divide the cost of your Iron Age Sprayer among the various uses and it will be small indeed, while the earnings will be greatly multiplied. The same crop insurance will be extended to cover many crops.

Iron Age Engine Sprayers do a *real* job. They work at high pressure—fully 250 lbs.—reducing the spray material to a fog that clouds around and under every leaf, stalk, twig, and goes into the cracks of the bark, leaving no place for insect or disease.

The two-wheel sprayer, shown here, is best for hillsides and where easy, short turning in orchard is necessary. We also make four-wheel orchard sprayers of larger capacity. Also barrel and hand sprayers.



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work more steadily than others—how the stuffing-box and hollow plunger principle does away with the old bored cylinders and plunger leathers or rubbers that corrode and wear out. See the ball valves that have nothing to wear out or corrode. Many points such as these ought to be looked into before you buy a sprayer.

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Dusting in Nova Scotia

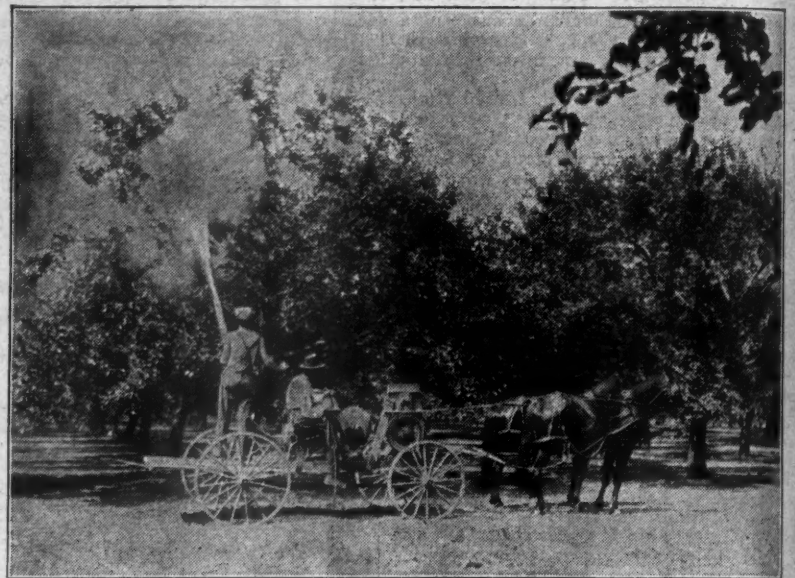
By Earle W. Gage, New York

IN Annapolis and Cornwallis Valleys, Nova Scotia, two of the most famous fruit growing regions of America, dusting trees against ravages of insects and disease has been demonstrated as practical and economical. Prof. W. Saxby Blair, superintendent of Annapolis and Cornwallis Valleys Experiment Station says: "We have been conducting experiments with the fine sulphur powder combined with dry arsenate of lead, the former to control apple scab, the latter insects, and comparing it with the regular lime-sulphur-

be as effective as spraying. Experiments conducted at the Nova Scotia station would show this to be true. There may, however, be some conditions not encountered during the two years of the experiments, which would change the result.

Considerations in Dusting

The matter of dusting versus spraying, therefore, as a practical orchard operation, resolves itself into a question of application; the cost of equipment necessary to do a thorough job, the cost of materials,



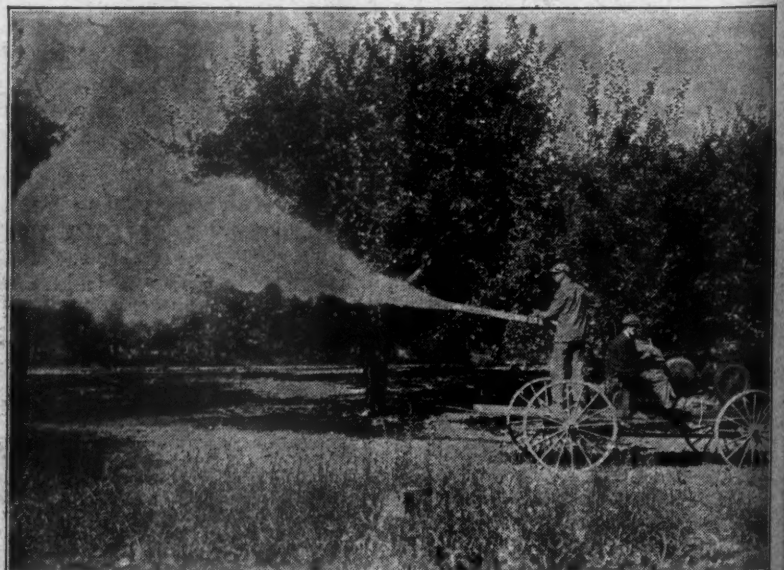
Dusting Will Cover Top of Trees

arsenate liquid spray, usually used for the control of this disease. These experiments show dusting, properly done, more effective than spray and more reasonable to administer."

The dust spray is applied with a power-blowing machine, which throws out a cloud of dust. This envelops the entire tree, settling on the leaves as a fine dust coating, thus giving the necessary protection by preventing the germination of apple scab spores, and killing any insects which feed on the parts dusted. The powder is very fine and sticks readily to the leaf. There

cost of application, and the skill of the operator in doing the work.

"We think it would be unwise for orchardists generally to do away with their power-spraying outfits and invest in dusting machines," says Prof. Blair, "although this may be advisable in some cases. The cost of materials will be much more per acre, as there is more waste in doing a good job with dust than with the sprays. The extra cost of materials will be offset by the lessened cost of application of the dust, which can be applied very much more rapidly, in fact as fast as a team can walk



Dusting to Cover Lower Branches

does not appear, from these experiments, to be any necessity to apply the dust when the foliage is damp. It seems, however, that a heavy rain immediately following an application of dust will wash considerably more of it off than had it remained on the foliage one night, as the atmospheric night moisture tends to set the dust particles into the leaf, and the coating gives the necessary protection for as long a period as do the liquid sprays applied.

It will be readily seen, therefore, that if the dusting is properly done there seems no good reason why the dusting would not

between the trees. The skill of the operator is a big factor, and good judgment, and rapid handling of the blowing tube, are necessary if a good distribution of the dust is to be made. There is not the wet foliage to guide one, as in the case when spraying, as the orchard is enveloped in a cloud of dust, and some portions of the air may contain many times the number of dust particles that other portions do."

"Difficulty is always experienced in getting a thorough job done at the top of the tall trees with liquid sprays. It has been noticed that such trees dusted, have





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STANDARD SPRAY PUMP

The Universal Sprayer of a Hundred Uses




This simple, powerful, all brass sprayer really "gets" parasites because it sprays both sides of the leaves; penetrates all crevices even to the very tops of the highest trees. Operated from ground. Attached to knapsack (at small extra cost) it sprays field and garden as fast as you walk. Effective also for spraying live stock, for disinfecting and whitewashing. Hardware dealers and seedsmen sell the Standard. If unobtainable at your dealer's, write us. Price \$5.00 prepaid. West of Denver and in extreme South \$5.50. Send today for Catalog D

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general a better control of scab at the top than do the sprayed trees. This, however, is a matter for the operator to correct, because tall trees can be sprayed so that scab is controlled as well at the top as at the bottom of the tree.

It has been said that foliage injury, which is quite common on all sprayed trees, will not occur on dusted trees. Nova Scotia experiments showed this not to be true,

as they found injury might follow dusting. But they state that it is not likely to follow, as the foliage injury is less, being not noticeable, which cannot be said of the liquid spray. The injuries were traced to arsenic in the dust, and the amount is evidently determined by the percentage of arsenic in the dust, and the period during which the foliage may be moist following the application.

Tests with Spray and Dust

The tests conducted at the Nova Scotia Station show the following results with a mature Gravenstein apple orchard, during 1918 season:

	Scab and Insect Injury				Per Cent Insect Injury
	Bad	Medium	Slight	Total	
Lime sulphur.....	.07	.0	.96	.03	.5
Dust.....	.1	.4	6.6	7.0	.8
Check.....	3.4	6.2	53.1	67.7	2.0

The amount of material used, time required to apply it, and cost of material and labor was as follows:

	Amount of Material	Dust	Spray
Amount used per tree one application.....		2.86 lbs.	6.82 gals.
Amount used per tree four applications.....		11.44 lbs.	27.28 gals.
Amount used per acre, 40 trees, one application.....		114.4 lbs.	272.8 gals.
Amount used per acre, 40 trees, four applications.....		457.6 lbs.	1,091.2 gals.

Time Required

Time required per tree one application.....	.81 min.	5 min.
Time required per tree four applications.....	3.24 min.	20 min.
Time required per acre of 40 trees, one application.....	32.40 min.	3 hr. 20 min.
Time required per acre of 40 trees, four applications.....	2 hr. 9.6 min.	12 hr. 20 min.

Cost of Material

Material per tree one application.....	\$ 0.3003	\$0.0716
Material per tree four applications.....	1.20	.2864
Material per acre of 40 trees one application.....	12.01	2.86
Material per acre of 40 trees four applications.....	48.04	11.44

Cost of Application

Cost of application per acre, 40 trees, one application.....	\$.486	\$ 3.00
Cost of application per acre, 40 trees, four applications.....	1.94	12.00

It will be seen that the four applications per acre of 40 trees cost as follows:

	Cost of Dust and Spray	Dust	Spray
Cost of material.....		\$48.04	\$11.44
Cost of application.....		1.94	12.00
		<hr/>	<hr/>
		\$49.98	\$23.44

Which shows that the cost per acre was \$26.55 more where the trees were dusted than where liquid sprayed.

Meeting of Tennessee Horticultural Society

ON WEDNESDAY, Jan. 29th, the Tennessee State Horticultural held a meeting remarkable for enthusiasm among the many members present. Much constructive work was accomplished and the spirit of the occasion was of good augury for the success of this organization in the future. The Society obtained a charter from the state, and it is asking for an appropriation of \$5,000 to assist it in carrying on its work. At the session for the election of officers, the following were elected for the ensuing year: President, B. A. Craddock, Humboldt; vice-president, I. C. Murphy, Columbia; secretary and treasurer, Prof. G. M. Bentley, Knoxville.

The proceedings were as follows:

President's Annual Address—Orchards of the Past and Orchards of the Future—T. D. Reed, Goodlettsville.

Report of the Secretary-Treasurer—G. M. Bentley, Knoxville.

A Uniform Apple Grading and Packing Law for Tennessee—I. C. Murphy, Columbia.

A National Fruit and Vegetable Standards Bill—W. M. Scott, Specialist in Fruit Grading and Standardization, Washington, D. C.

Co-operation in Relation to Fruit Growing—Robert L. Morris, Ridgeway.

Status of Fruit Growing in Davidson County—E. Thomae, County Agent, Nashville.

A Brief History of Fruit Growing in the Chattanooga District—Robt. S. Walker, Chattanooga.

Appointment of Committees—Nomination, Resolution, Auditing, Legislation, Membership, Publication, Advertising, Exhibits.

Report of Committees.

Election of Officers.

Apple Growing in the Highlands of Tennessee—J. M. Brown, Signal Mountain.

The Commercial Possibilities of the Swamp Huckleberry—Geo. E. Murrell, Horticulturist, Washington, D. C.

Tennessee Peaches—J. L. Jones, Columbia; N. S. Varnell, Cleveland; W. D. Wade, Kenton.

Our Possibilities in Commercial Fruit Growing—Judge Robert Ewing, Nashville.

Recent Developments in Blight Control—Without the Knife—B. G. Pratt, New York, N. Y.

It Pays to Advertise—W. T. Bland, Chattanooga.

The Spray Gun—A. E. Hyde, Hudson, Mich.

The Advantage of Early Trucking—Bessie Moore Partee, Asst. City Agent, Nashville.

Sweet Potato Rots in Field and Storage—S. H. Essary, Agricultural Experiment Station, Knoxville.

Co-operative Growing and Marketing—E. O. Hind, Indianapolis, Ind., Hind & Fuchs Co.

A National Law to Regulate Commission Merchants—Samuel Adams, Editor AMERICAN FRUIT GROWER, Chicago, Ill.

Conservation of America's Orchards, Rejuvenating the Old Orchards and Planting New Ones—Paul C. Stark, Louisiana, Mo., Stark Bros. Nurseries & Orchards Co.

A Report of the Judges of the Fruit Display. Awarding of Prizes.

Auction of the Fruit on Display (Proceeds to go to Society).

It was decided to make an exhibit at the National Apple Show, at Chicago, next fall. The general feeling was that a new era had started for the society.

The Russian Provincial Zemstvo has applied to the United States for motion pictures showing agricultural production, highway construction, and forest work in this country. More than 20 motion pictures will be sent in response to this request which that Russia can only be restored through the application of every branch of economical activity of the most modern machinery and methods of production. The Russian peasant is still too backward for the general application of more advanced methods and machinery and it is thought that the motion picture will supply the speediest means of education.

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The kind they use is none too good for you. You want your trees, shrubs and hedges to grow and thrive.

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Rhode Island Growers Meet

By R. M. Bowen, Rhode Island

THE ANNUAL Meeting of the Rhode Island Fruit Growers' Association was held at the Shepard Parlor, Providence, R. I., Friday, January 10, 1919, with a very good attendance of members, representing every county in the state. Following the custom of several years, dinner was served at 2 o'clock, which tends to make the meetings a social as well as an instructive and business meeting. Following the dinner Mr. Abel F. Stevens, of Wellesey, Mass., read a very interesting paper on "Birds and Bees, Their Value in Orchards," and closed with some very practical suggestions in regard to spraying and spray mixtures.

Hon. Everett E. Brown of Pomfret, Conn., spoke highly of Rhode Island grown fruit, and complimented the Rhode Island growers on their painstaking care of their orchards, as has been shown by so many of the prizes taken and the beautiful apples that they have exhibited at the different New England Fruit Shows and elsewhere.

Prof. Geo. E. Adams, of the Rhode Island State College, gave a pleasant talk and told how many of the professors and students at the College had gone to war and what a fine record they had made. He spoke of how many had been killed or wounded, among the former being Professor Corriveau who was the head of the pomological department and who had made a success of his work there and throughout the state. His loss will be keenly felt for he was well fitted for his position and it will be difficult to find a successor who will be his equal.

The Secretary's Report

The secretary's report showed the membership to be 123 and stated the reason for omitting the Annual Show in 1918 was because of the help conditions which prevented the growers from taking proper care of the commercial part of their business, and permitted no time to prepare for a creditable exhibition such as the Society has always had. Another reason for omitting the show was because everyone's mind, time and money was wholly absorbed in war work, and the executive committee felt that the public would not be interested enough to make the attendance satisfactory. Members of our Society did however send apples to the exhibition of the New England Fruit Show at Portland, and helped very much in making the fruit departments of the County and Grange shows throughout the state a success.

Treasurer's Report

The treasurer's report showed all bills paid and a balance on hand in the general fund of \$116.62 and in the permanent fund of \$1,828.28, \$1,500 of the latter being invested in United States Liberty Loan Bonds. The treasurer feels that this is a remarkable good showing considering that the Society is but five years old and that it has never charged admission to its shows or entertainments, believing it to be one of the main objects of the Society to interest the public in home grown fruit and to try to increase its consumption. Teaching our growers that to make a success of apple growing they must care for their orchards so as to raise more and better fruit, in order that their products will appeal to the consumer and encourage him to use more and more each year.

The person who sees and eats a beautiful McIntosh Red apple raised in Rhode Island will remember it for a long time and want more, while the same person, who happens to eat an inferior grade of apple, will not be favorably impressed and the chances are that his appetite will become more inclined to an orange than to an apple. This is all right for Florida or California but not for Rhode Island, and while our Society has the very best feelings towards, and wishes for the success of all other state societies, it is firmly impressed with the maxim that "charity begins at home," and that it is the duty of this Society to educate the people of Rhode Island to eat and consume in other ways Rhode Island apples. This will support Rhode Island growers and encourage others to enter the business, to the end that much of the non-productive land in the state shall be improved.

In so doing we not only encourage our own residents, but attract a desirable class of people from outside Rhode Island to

locate here and become permanent residents, thus increasing the taxable value of the land and at the same time teaching the large population of our crowded cities the beauties and benefits of country life and trying to get them interested in nature and nature's work instead of in the "movies," which seem to be so attractive to them now.

The Nominating Committee recommended the re-election of the 1918 officers and they were unanimously elected as follows:

President, Nicholas S. Winsor, Greenville; vice-president, John M. Dean, Meshantecut Pass; secretary, H. T. Bodwell, Cranston; treasurer, Richard M. Bowen, Buttonwoods; members of executive committee for 3 years: Thos. K. Winsor, Greenville; auditor, Thos. H. Matteson, Washington; exhibition committee: Richard M. Bowen, Buttonwoods; Frank Farrar, Greenville; A. J. Myers, Providence.

Prof. F. C. Sears of the Massachusetts State College was elected an honorary member of the society.

It was voted that the executive committee be authorized to act in behalf of the society in regard to the proposed Uniform Apple Grading Law for New England, which is to be brought before the different state legislatures this winter, and a meeting of the executive committee was announced at the secretary's office on Friday, January 17, to discuss this important matter. All the members were invited and urged to attend.

The Annual Meeting of the New England Fruit Show was held at the State House, Boston, Mass., on Wednesday, January 29, with a good attendance of members present. It was voted to hold the 1919 show at Hartford, Conn., during the week of November 10th, providing the Connecticut State Armory there can be secured for the purpose. It was thought by the vice-presidents from the different New England states that there would be 2,000 boxes of apples exhibited, besides barrels, plates and collections. It was also agreed that the jelly, preserves, etc., exhibit, and the apple products departments, should and would be larger than ever before. Considering the territory to supply fruit locally, and the willingness on the part of the other New England states to help make the first exhibition of the New England Fruit Show in the State of Connecticut a success, it would seem that the 1919 show must be equal of any that the society has had since it was organized in 1909. With the knowledge, experience and energy displayed at previous fruit exhibitions of the Connecticut Pomological Society, and the determination of Mr. Chas. L. Gold of West Cornwall, Conn., who has been vice-president from Connecticut of the New England Fruit Show since it was organized, to have a show which will be the equal of any held in the other New England states. No one doubts the result.

The matter of a uniform apple grading and packing law for each of the New England states, was discussed, and it was unanimously voted "That this Society place itself on record as favoring the adopting by each New England state of a law as agreed upon by the representatives from each state, in regard to the uniform grading and packing of apples." The Society also condemned any organization or association which solicits stock subscriptions for orchards to be planted, unless it is shown that there is merit in the enterprise, and the services of the vice-president from each New England state was volunteered in ascertaining the value of such orchard property for any intending purchaser.

The following officers were unanimously elected for the ensuing year:

President, J. Lewis Ellsworth, Worcester, Mass.; vice-president, Wilfrid Wheeler, Concord, Mass.; secretary, F. Howard Brown, Marlboro, Mass.; treasurer, A. Warren Patch, Boston, Mass.

The civil engineers of the University of Illinois have installed a thermograph on the Bloomington road. This is the first of a series of studies of the expansion and contraction of road surfaces and of the action of frost. From the data afforded by this instrument it is expected that light will be thrown on some of the now indefinitely factors of road design.

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Field Demonstration of Tractors

By Alvah H. Pulver, New York

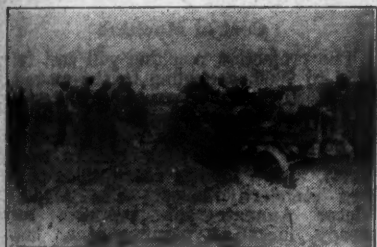
Tractor owners in Erie Co., N. Y., received a questionnaire this summer from the farm bureau covering their experience with the machines. The replies give some information of value, gathered from farm lands of mixed farming and fruit growing. About one-half of the farms were tabulated as rolling, the other half being level. The average time the tractors had been owned was less than two years. Practically all were kerosene driven and the average cost



A Large Number of Farmers Watched the Demonstrations

per hour for fuel was 28 1/4 cents. Most of the men thought they would prefer three speeds, two forward and one reverse. Satisfactory results were obtained on any land except where excessively wet.

As to experience required, the consensus of opinion was that a person who can handle other farm machinery well and who has good ordinary mechanical ability, can easily learn to run a tractor; however, one year's experience was to be preferred. It also was the opinion of a number of men that they would prefer four-cylinder engines. The greatest amount of work



The Plowed Ground Shows the Excellent Work Done by Tractors

done by tractors was plowing and harrowing; next came belt work, principally silo filling and cutting wood.

The success of the tractor in general was placed upon the ability of the operator not only to keep the machine in the best workable condition through proper lubrication, right mixture of fuel and air, proper timing of spark, keeping all bolts tightened, and many other necessary details, but also upon his ability to devise ways and means of making the tractor perform much labor that the average tractor owner imagines can only be handled by means of farm teams.

WANTS STATE AGENTS

By A. A. Eastman, Maine

Our country is starving for want of knowledge on large and small fruit culture. Our state government ought to take up this line of work and send good men who understand this line of work out among the farmers and in the grange. They will tell the people how to grow the fine fruit that is not being grown to any great extent among the people of our country, save by some specialists.

We have lots of smart, bright people who would take up fruit culture if they had some starting point, a little knowledge, some one to give them a short lecture on how to make a beginning. Many have a fine location, but don't know it. Some have a very poor location, wet and frosty, and don't know it. This will ruin the best man's courage and then he won't know what the trouble is with his berry patch, while if he was posted on these lines he would know what the best locations are.

It is stated that the United States has 5% of the world's population and 33% of its wealth. In other words, one-twentieth of the people and one-third of the money of the whole world.

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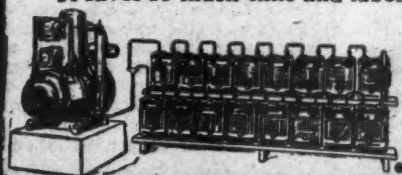
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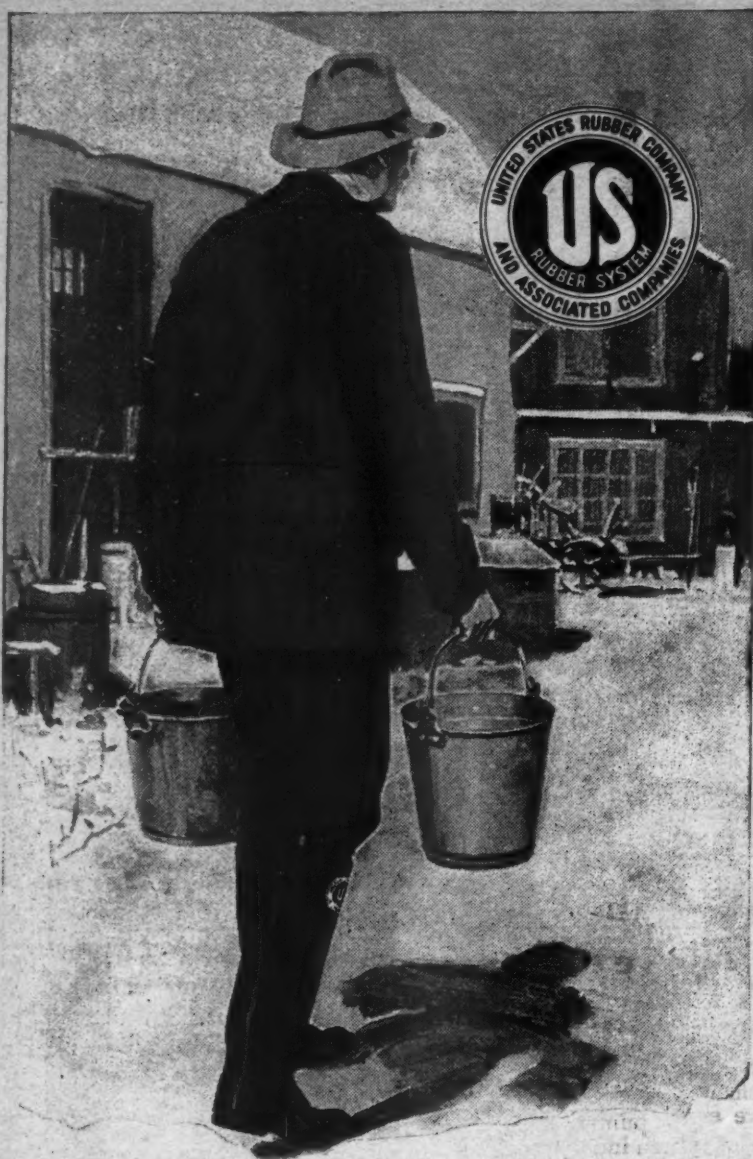
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United States Rubber Company
New York

U. S. Rubber Footwear

Solving the Labor Problem by Moving Pictures

By Ernest A. Dench, New York

THE DEMAND for labor among fruit growers being many times greater than the supply, it is up to the fruit grower to convert the unskilled workers into skilled employees. But how? That is the question—a vital one affecting every fruit grower to a more or less degree.

Lecturers and textbooks are both excellent in their particular way, but they can be made doubly effective as well as attractive with the co-operation of the motion pictures. The motion picture begins where the lecture and textbooks leave off. The motion picture, instead of trying to explain technicalities, shows them without the need of wading through a lot of explanations in order to get the gist of them. The appeal of the motion picture is universal because the eye knows no language.

This the Bureau of Commercial Economics of Washington, D. C., has realized in establishing its motion picture library. The booklet gotten out by the bureau, besides giving a partial list of the available subjects, tells how the bureau is maintained:

The bureau is maintained through contributions and annuities.

Contributions are invariably voluntary and no one is authorized to solicit the same.

No film is shown for a money consideration under any circumstances, nor is preference given a film or subject on account of a contribution.

Contributions are received and acceptable only to an amount sufficient to cover transportation, and the bureau is not operated for profit and has no capital stock.

The surplus funds of the bureau will be used in the production of welfare films, first aid to the injured, including the resuscitation of the drowning and the emergency methods of rescuing imprisoned miners, and the awakening development of civic pride and patriotic American citizenship.

In describing the methods by which the bureau operates, the booklet says: "Co-operation of the universities consists in displaying the pictures, thus affixing their seal of approval as to their character and quality, and then circulating them in their community centers to adult audiences who are in sympathy, as their own university stands sponsor, for which extension work many states make appropriations."

Films Furnished Free

The bureau does not wish to encourage any fruit grower or agricultural school to engage in visual instruction or to incur any expense whatever in connection therewith, unless it feels it is a privilege and that substantial benefits may accrue therefrom, in which event the bureau will be glad to contribute films if the fruit grower or college install a standard motion picture machine of any well known make, and the same be operated by a capable and competent operator.

The bureau wishes to caution any fruit grower using films to comply strictly with the fire regulations obtaining in local communities and observe the laws relative to censorship, in the belief that better results accrue if collision with local authorities is avoided.

Experience has shown that substantial support is given by local peace officers to this philanthropic work wherever effort is made to protect and save from harm those who seek information and enlightenment.

The bureau requests that all communications from manufacturers and others furnishing films, relative to the display of films or attendance, be forwarded to its office in Washington, D. C., for attention, as the bureau does not desire to have any hardship which the bureau can relieve imposed upon the institutions in connection with its work.

How to Secure Films

All applications to the bureau for its films are forwarded to the co-operating university from whose jurisdiction the request has come, as the bureau does not seek any publicity for what it is doing, but prefers that such credit be given to the local institutions, in the belief that this will develop local pride and effort on the part of the public to support and encour-

age the movement. The bureau is quite willing to make its contributions in this behalf as an anonymous giver.

The service of the bureau is also available at the present time in Canada, Latin American Republics, India, China, Japan, Australia, New Zealand and South Africa, with titles and sub-titles of all films in the language of the countries addressed.

Showing the Films

In selecting an existing room on your fruit farm which can be remodeled into a passable motion picture theater, the following points should be borne in mind: The room should be lofty, well ventilated, and large enough to accommodate your employees. It should also, if possible, be free from obstructions in the way of pillars and other supports, and should, furthermore be situated on the ground floor.

The fire, danger is ever imminent, and this can only be met by providing plenty of exits. There should be at least four exits, which must open outward. It is advisable to divide the rows of seats into sections so as to provide for an aisle on each side, not less than three feet wide.

If the room happens to be constructed of wood, this does not make it wholly unsuitable, but to make it safe, plaster metal laths or wire mesh over the wall and ceilings.

Chairs or benches should be fastened to the floor, because if a fire occurs the seats will be overthrown and they will interfere with the orderly egress of the crowd. It is customary in the design of such buildings to allow each spectator four and a half feet of floor space.

Cost of Machine

The projection machine will cost from \$155 to \$300, according to the make selected. If the initial costs appear too big, a machine can be rented on reasonable terms, or a second-hand model purchased from the local motion picture supply house. Here follows descriptions of the best standard makes: The Model 2 Victor Animatograph produces rock-steady, flickerless pictures of an image quality that makes an audience oblivious that it is produced by mechanical means. The Edison Kinetoscope may be safely recommended, because it can be easily manipulated with little experience and stands up well under hard service, it is made in two models. The distinguishing feature of the Cameragraph No. 2 A is that it is provided with a special device feature which lessens the danger from fire. The Simplex has many desirable features in its construction, which include simplicity of design and protection against fire hazards. The Edengraph is noteworthy on account of the fact that it produces perfect projection when operated by an experienced operator, several special features being provided that are not found in other machines. The Motiograph is popular, owing to its durability and to the broad guarantee which is given by the manufacturers.

Some Requirements

The authorities in various parts of the country insist upon the projection machine being enclosed in a fireproof booth, so that if there is an outbreak of fire it cannot spread farther. Here an expense of \$65 is involved, but it is worth it in the interests of safety first. This booth, made of galvanized iron, gives the operator plenty of room in which to work, and is shipped to you in parts, the whole being easily set up with nuts and bolts.

Carbons are needed to run the projector, and it is cheaper to buy these by the case, which contains one thousand. They cost from \$12 to \$44, but the prices vary according to market conditions. The next important link is the screen. In the days gone by a tablecloth and bedspread have been used, but science has come to the rescue and now there are screens and to obtain the best results it will be necessary to pay about a dollar-fifty per foot for the material.

For seating accommodation I would recommend opera chairs. These are made in many grades, but I do not think you

ower
by

can do better than purchase those of a kind that will stand hard wear.

Have a Good Operator

You may show the newest and best motion pictures produced today, but if they flicker, get out of focus and breaks occur quite often, you stand a good chance of getting the spectators disgusted. This means you will have to secure the services of a competent operator, who demands from \$15 to \$25 a week for an eight-hour day.

If, however, you have a man on your staff who is well versed in electricity he is in the position of the photographer who takes up cinematography. He is acquainted with the fundamentals of the craft, and it is therefore easy for him to become an expert operator.

If he is the right sort of man, he will not object to doing two or three hours overtime of an evening, and perhaps you can arrange his regular job hours to be curtailed to ease any strain that might occur.

Points for Operators

Have your operator focus the projection machine exactly in the middle of the screen, not an inch to the right or the left, or an inch below or above. If this is not attended to, no matter in what advantageous position a spectator sits, he will either have to hold his head up high or else the objects in the picture appear unnaturally long and slim. The rays of light take straight path, and if they are compelled to turn aside, a peculiar annoying effect is produced. In selecting suitable lens the size of your building, make of projecting machine, the length and height of your screen and the distance from the operating booth to the screen must be taken into consideration. It is false economy to purchase cheap lens, and when ordering always furnish the supply firm with the foregoing particulars, so they may execute your orders intelligently.

Once your operator gets acquainted with the various makes of film he will discover that there is no standard perforation gauge. This results in the film jumping the sprockets and many breaks.

Carelessness, however, is sometimes responsible for these defects, and your operator should make this his creed:

"On receiving the films I will inspect them for breaks, which I will repair. Every time the film leaves the sprockets I will halt the projector in order to set it right."

"When stopping the machine I will throw off the switch."

"When re-winding the films as through with, it will not be my fault that they are scratched, thereby shortening their life. I shall carefully but firmly exert a pressure against the disks of each reel I am in the process of unwinding. I shall find it evenly wound and no damage done despite the speed at which the film I gave proceeded."

The standard speed at which pictures are projected is sixteen "frames" to the second. There are sixteen of these "frames," otherwise tiny pictures, to each foot of film, and each reel takes about fifteen minutes to unspool. If projection is faster, things in the film move at a rapid, mechanical pace, while explanatory matter is matched off before it can be grasped.

You will also have to provide your operator with a tool outfit, which should include cement for mending broken films, a file for sharpening carbons, lugs, reels and machine oil.

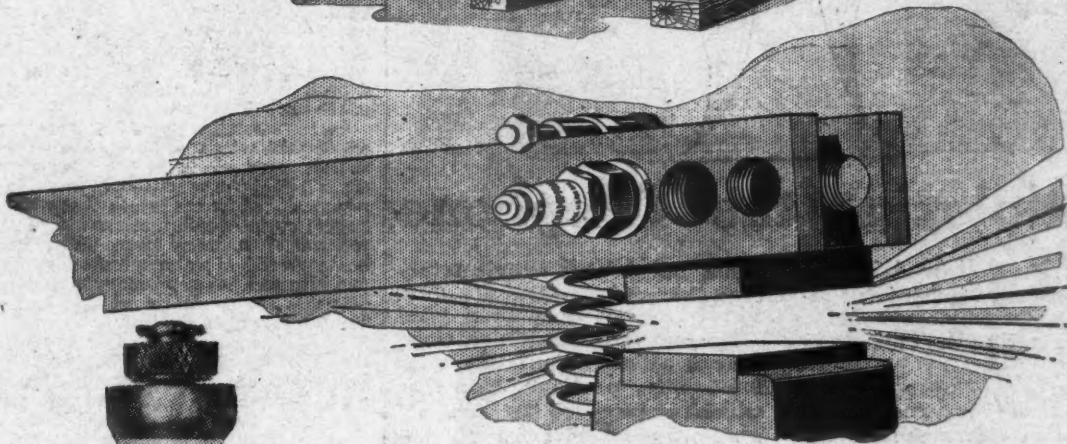
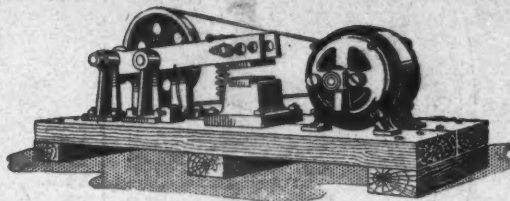
NATIONAL HOLIDAYS

By John Coville, California

"We have too many of them," you are apt to exclaim, and if that is your idea you will be very much surprised to learn, as I did but recently, that we have no national holiday at all. No, sir! not a single one. Even the Fourth of July is not a national holiday, but only a legal one in all of our states and territories and insular possessions. Thanksgiving, being proclaimed by the President, is only legal in the District of Columbia and the territories. The various holidays which most of us are accustomed to rank as national, such as Christmas, Memorial day, Washington's birthday, etc., are legal holidays made so by the states themselves, and not by federal enactment. These facts came to me as novel and interesting and I thought they might be so to a number of the subscribers of the AMERICAN FRUIT GROWER.



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In these last four decades thousands of Bell engineers have developed a system of telephonic communication, so highly perfected that the same crude instrument which at the beginning could hardly carry speech from one room to another can now actually be heard across the continent. This is because of the many inventions and discoveries which have been applied to intervening switchboard, circuits and other transmitting mechanism.

The vision of the engineers has foreseen requirements for increased communication, and step by step the structure of the art has been advanced—each ad-

vance utilizing all previous accomplishments.

No one step in advance, since the original invention, is of greater importance, perhaps, than that which has provided the multiplex system, by which five telephone conversations are carried on today simultaneously over one toll line circuit, or by which forty telegraphic messages can be sent over the one pair of wires. As in a composite photograph the pictures are combined, so the several voice waves mingle on the circuit to be again separated for their various destinations.

By this wonderful development the Bell System obtains for the public a multiplied usefulness from its long distance plant and can more speedily and completely meet the needs of a nation of telephone users.



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Top-Working the Apple

By Stephen Helmar, Burton, Indiana

THE PURPOSE of top-working the apple is to change the entire bearing surface to a different variety from that originally borne by stock or trunk of the tree. The methods of doing the work, and the location of the buds or grafts, are more or less familiar to most orchard men. The system is valuable to the grower who has been unfortunate in securing trees that are not true to name, or is in doubt as to the genuineness of the variety he has planted, or wishes to change the head of the tree to more desirable varieties. Scions inserted on trees of bearing age will usually begin to fruit the third year from the time the graft was set, while on younger trees the time of fruiting will depend both on the general characteristics of the scion and stock.

On trees that have been five years planted, or older trees that have already begun to fruit, top-working them to another variety is a doubtful practice and is not to be recommended for the reason that with the larger tree the equilibrium is so upset by the removal of so many large limbs that a heavy growth of water sprouts is induced, and with such heavy pruning the trunk and branches are no longer shaded and sun scald does serious damage.

Blight is another serious factor entering into the operation, for, with the larger tree the scions make such rapid growth that they are very tender and susceptible to blight. Once this disease attacks the growing shoots it is almost fatal to the tree, as the disease works rapidly down into the main limbs or trunk and then the tree is doomed. If blight attacks the limbs it

good healthy leaf buds showing. Fat, thrifty water sprouts cut from the branches of the bearing tree make good scions, but if no water sprouts are available, then the terminal growth on the ends of the branches may be used, care being used in the selection of nice plump wood.

The scions should be cut in the spring just before the buds swell, and the grafting done at that time, and if the scion has been cut at both ends then the upper end must be covered with grafting wax to prevent



A Husky Three-Year-Old Graft

Note swelling in stock where union was made. Ben Davis top-worked to Delicious.

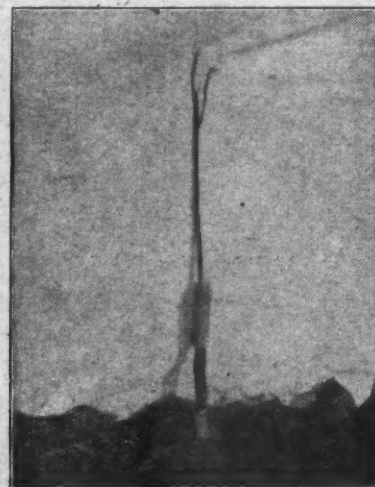
drying out of scion before it has united with the stock. If terminal branches are used then the terminal bud must be left.

Some Natural Laws

In top-working young trees certain laws of nature must be observed and it is well to remember that like begets like. While top-grafting is primarily to change the bearing wood into a more desirable variety, yet certain improvements can be made in changing the nature of the fruit desired. This can be worked out only through long years of observation, and then it is not an infallible rule. However, enough is known to give the orchardist some clew to follow in doing the work.

For instance, Ben Davis makes ideal stocks for top-working to Rome Beauty, Delicious, or York Imperial, the two woods uniting nicely and making an even growth, but Delicious worked upon Benoni does not do so well for the reason that the Delicious wood outgrows the Benoni stock and makes a weak joint in the trunk. Again, Northern Spy worked upon Geniton is a failure for the reason that the Northern Spy wood is a slower grower than the Geniton and the union of the two woods is imperfect. Again, Grimes Golden worked upon Geniton produces all that could be desired both in union of wood and quality of fruit, improving this well-known variety by making it later in maturing, of larger size and better keeping qualities.

Delicious top-worked to Geniton is a success in so far as union of stock and scion is concerned, but it makes the fruit



One-Year-Old Graft—Two-Year-Old Stock

is recommended to saw off the limb several inches below the infected area, which is thoroughly orthodox on trees which have not been top-worked, but in the top-worked tree this must be avoided as there has already been removed too much wood growth to permit further pruning without disfiguring the tree permanently.

Best Age for Top Working

Blight does not affect younger trees so seriously, and with trees less than five years old, one, or not more than two, limbs can be grafted each year without throwing the tree out of balance and encouraging sun-scald and blight. The best success is to be had in top-working two-year-old trees one year planted. At this age the bole or stock of the tree is of sufficient diameter, or caliper, as termed by the nurseryman, to permit of enough spring in the wood to hold the scion firmly in place, and the tree has enough vigor to start the scions into immediate growth. It is not safe to try to top-work trees the same season as planted for the reason that they are weakened in vitality by transplanting and do not start the grafts growing vigorously. All newly top-worked trees should be carefully gone over two or three times during the season and the new growth cut back moderately to prevent the wind whipping out the graft before it is firmly united with the stock.

If the orchardist wishes to be absolutely sure of the variety he wishes to graft, it is best to cut the scions from bearing trees in the neighborhood, securing wood of one season's growth, well matured and with



Six-Year-Old Geniton Top-Worked to Northern Spy

Note one-sided appearance of tree. Damaged by blight smaller and more uniform in size and later in maturing. To make a resume of the different experiments along this line, it is safe to say that the tart and medium tart apples should be worked together, and the more mild flavored ones, like Bens and Yorks can be united successfully, always keeping in mind the season of ripening and the similar characteristics of scion and stock.

A Legal Decision

In the case of Lunt vs. Brown a decision was recently handed down by the New York Court of Appeals in favor of the defendant, also establishing a measure

damages for the orchardist who plants "misfit" trees. The measure of damages being assessed by this court as the difference between what the land is worth when the error is discovered and what it would be worth if the trees had proven true to name. In this case defendant suggested to plaintiff that the trees be top-worked to Baldwin stock.

At this time the trees were between four and five years old and they were top-worked by an expert, but the evidence proved that the operation was a failure, "the trees being very hard wooded and practically worthless after the operation was performed," which further proves the statement in the foregoing part of this article that it does not pay to top-work trees after they reach the bearing age.

It is said that there are but two fables in the Bible from each of which we are to draw a lesson. In 2d Kings, 14-9, we read, "The thistle that was in Lebanon sent to the cedar that was in Lebanon, saying, give thy daughter to my son to wife, and there passed a wild beast that was in Lebanon and trod down the thistle." We should be careful in orchard practice not to try to unite the thistle with the cedar lest a wild beast destroy our work.

BACK-LOT MONEY

By Mrs. B. F. Wilcox, Colorado

Millions of dollars are lost by people in cities not using their back yards for poultry. There are thousands of acres of idle land that could be made to return a dividend. The thrifty Japs make every foot of soil produce. They farm mountains and hills that Americans would not touch. The Americans are wasteful, but since food has become so high they see that the land is the source of the bread of life, and we find many using their back yards for gardens or poultry.

Many raise a garden, and when fall comes buy pullets and keep them for winter eggs, selling the pullets in the spring, thus raising two crops off the same ground. By right methods poultry and eggs are easily produced in back yards at a good profit. The day is coming when not only vacant town lots—but all back yards will be producing something of value. In some cities, many have a few chickens on the roof.

Candy and Chickens

A man who conducts a candy kitchen in a large city has 400 hens in a building in his yard back of the store. These hens are kept in this building both on the first and second floors. He devotes two hours' work daily to this flock and they bring him in an income of \$1,000 a year. The egg yield is due to comfortable quarters and special system of feeding. He gets much feed at a low cost in this large city. He buys stale bread and skim milk from the creameries at reduced prices. He buys lawn clippings from the town boys at five cents per bushel. When the days are short he turns the electric lights on. He says the hens have to have a long day in which to work to turn out a good egg yield. He gets his highest prices for eggs during the winter time and it is at this time that he makes the most money from his hens. He has the White Leghorns. No roosters are kept among the flock to annoy the people by their early crowing.

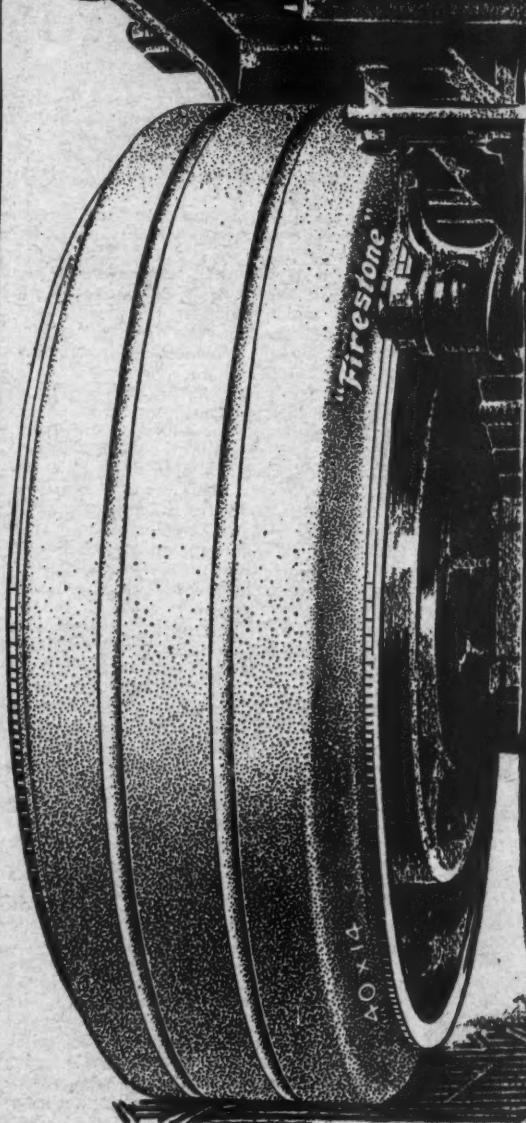
Opportunity knocked at this man's door and he heard. Opportunity is where you find it, and generally dependent on your finding it. Axiom has it that once, at least, opportunity knocks at every door, but for every time that it knocks to make itself known a hundred times it lies unobserved, while you pass unknowing. I wonder if any of you have heard Russell Conwell's great lecture, "Acres of Diamonds." If you have, you will always be the better for it, for therein he shows how we overlook our present opportunities for the things just a little farther off.

Get a Hobby

We need to open our ears for the jingle of coin which is in the back yard. Every man and every woman should have a hobby as a kind of recreation, occupation, something to enthuse over.

Anyone with time hanging heavy on his hands is a misery to himself and a nuisance to other folks, and the best medicine for the disorder is a hobby. A hobby lends itself to the means of all, for just a few dollars invested by the humble amateur or as many hundreds by the man of wealth. You may not have an "acre of diamonds" as per Russell Conwell, but you have a small gold mine which you may work, right in your own back yards, if you want to.

Including FARM LOADS



Half the Truck Tonnage of America is carried on

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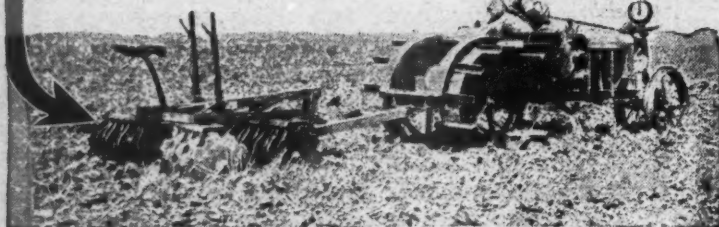
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SMALL FRUITS FOR PLEASURE & PROFIT

By S. J. Bole

The Selection of the Site

THE PERSON who grows small fruits in his garden or on a small plot of land has little if any chance to select a site. In such a case the site is already selected. However, a home is nearly always built on an elevated portion of land or else the soil is filled in to make it elevated. This is especially true of farm homes as one can readily verify by an extensive drive through the country. The buildings are generally located on the top of one of the highest portions of land through which the most important highway runs. In this case, the fruit garden for convenience is located near and so is often on a slope.

So far as spring frosts are concerned, the man in the city who grows fruit in his back yard, has special means of protection. The surrounding buildings and shrubbery afford a fairly good windbreak in every city and village. Then too, the heat from the chimneys and layer of smoke over a city greatly aid in preventing frosts. With a protection of mulch on his strawberries a city grower seldom loses more than his peaches, and in some cases these are saved, in case of frost.

The commercial grower, on the other hand, either has the opportunity of selecting a piece of land favorably located for fruit growing or selecting the most favorable portion of the farm that he already possesses. The selection of the site is an important consideration for the man who grows fruit to sell. The important factors to keep in mind in this selection are (1) kind of soil (2) water drainage (3) air drainage (4) exposure (5) windbreak and (6) influence of a body of water.

Kind of Soil

Both the surface and the subsoil should be examined. While most small fruit can be grown well on any soil that will grow ordinary farm crops, it is possible to have soil too rich as well as too poor. One can rarely get soil too rich for currants and gooseberries but strawberries, grapes and other bush fruits tend to produce too much vegetative growth and too little fruit. With strawberries, too many runners are produced and with blackberries and raspberries, crown gall and anthracnose is often very injurious where the soil is very fertile. If the soil is badly worn out, it may need to be brought up again in humus and fertility. However, the writer has seen sandy loam soil so poor that it would no longer grow corn and white beans, that grew raspberries and blackberries wonderfully well and without the addition of fertilizers.

A soil that can be readily worked and can be kept free from weeds is to be preferred. A sandy loam soil is one of the best and a clay loam with sand or gravel in the subsoil is good. It is somewhat difficult to add humus after the plantation has been started as straw and strawy manure will generally fill the soil full of grain and weed seeds. In this case, a cover crop can be grown from year to year and either plowed, disced or cultivated under.

By subsoil is meant the soil just beneath the upper few inches or that worked in plowing. The subsoil for small fruits should be loose enough to permit the roots to grow readily through it. Hard pan should be broken up with a subsoil plow. It should also be fertile, a clayey or gravelly subsoil being more fertile than one of pure sand.

Water Drainage

Water drainage consists of surface drainage and sub-drainage. The former is good if the land has enough slope to allow the water to drain off the surface. On the other hand, the slope should not be enough to produce washing of soil and plant food and loss of water. It is even more necessary in case of fruits than with grain crops, to have the lower portions of the soil soaked full of water.

Fruits of any kind do not thrive with "wet feet." They make a feeble growth and the danger from winter-killing is greatly increased. The amount of stones, gravel and sand in the subsoil is a good indication of the drainage, the greater the amount of these the better the drainage. If the slope permits, the sub-drainage can be wonderfully improved by tiling the land.

Air Drainage

Atmospheric drainage is largely dependent on slope and is a very important factor in the successful production of fruit. On a cloudy or windy night, one may expect a freeze if the temperature drops low enough but never a frost. It is only on still nights that the temperature near the surface of the grounds gradually cools down to the freezing point, that we get a frost. Only a little slope is necessary to prevent most frosts. In case of the slope, the lower and colder air being heavier gradually drains off to the lower levels and warmer and lighter air comes in to take its place. The prospective fruit growers should be sure (1) that there is slope enough below the site to carry away the cold air from the site and (2) that there is no obstruction such as a dense windbreak or tight fence at the lower end of the site to prevent the cold air from flowing away. This is more important in growing early blooming and tender strawberries than either the early blooming and hardy currants and gooseberries or the late blooming and tender grapes, raspberries and blackberries. Frosts often shorten a crop without producing a complete failure. This is especially true of strawberries and red raspberries, that blossom so unevenly. In these cases, any one frost destroys but a portion of the blossoms.

Exposure

Exposure is more or less dependent on slope and must be considered with reference to (1) sun and (2) wind. As the earliness of blooming and ripening depends on the temperature of the adjacent air and hence the amounts of sunlight and cold winds, it is readily seen how a southern slope might hasten the early blooming only to have the crop shortened by a late freeze. If however, an additional amount of sunlight is needed, as in case of fully ripening Concord grapes in the northern tier of states, a southern exposure would be an advantage.

The writer planted a ten-acre plantation two years ago that had a north and south slope made by a ridge running south of its center. The slopes were almost ideal for a small fruit plantation. Because red, purple and black raspberries blossom too late to be injured by a late frost and ripen too early to be injured by the hot sun, they were planted on the south slope. Beginning at the top of the ridge and extending down the north slope for some distance, were planted the strawberries. The north slope held the blossoms back a few days and aided somewhat in ripening on account of less sunlight and less loss of moisture.

Next to the strawberries and farther on down the slope were planted the currants and gooseberries. While these two fruits bloom early they are very hardy and one seldom loses a crop on account of frost. The reason for putting them on the north slope were to prevent the fruit from being scalded by the hot sun and to better conserve the moisture, as they ripen later than do raspberries.

The blackberries were planted at the lower edge of the north slope. This would have been too low for strawberries but all blackberries bloom very late, they are seldom injured by frost. However, intense sunshine is the greatest handicap in growing blackberries and they were located on the lower edge of the north slope to protect from being scalded on the bushes.

by the hot sun and from drying on the bushes on account of too much loss of soil moisture.

With reference to wind, the exposure of the site just described is bad. Located in the prairie region of Illinois and without a windbreak of any sort for several miles, the prevailing winds have a tendency to winter-kill the tender canes, blow the mulch from off the strawberries and to cause black raspberry canes to lean toward the east.

Body of Water

Those who have never grown fruit on land somewhat adjacent to and on the windward side of a body of water can hardly appreciate the influence of water on fruit-growing. In case of a large river or small inland lake, this influence is confined to a narrow strip of land one or two fields in width but in case of Lake Michigan, the influence reaches many miles inland.

Just how does a body of water aid the fruit grower? Buds start when the air warms up sufficiently. This is seen when a fruiting branch is either cut from the tree and placed in water in a room or when the branch of a nearby tree is bent through the window into the house. In either case, the buds burst and blossoms appear, even when the ground is frozen and covered with snow. Cold air and winds have just the opposite effect. Thus it is seen why fruit trees and bushes are slow to blossom on the windward side of a body of water, which warms up in the spring so much slower than does the land. The bloom is thus delayed until danger from frost is generally past.

The same but opposite effect is seen in the fall and early autumn frosts seldom occur to injure the canes which are filled with sap and are as yet not well-ripened. Then too, a body of water keeps the air over and adjacent to it from changing as suddenly as it does over the land. Sudden changes in temperature always produce harmful effects on fruiting trees or bushes.

This is rather a technical discussion of the fruit site but since success or failure in fruit-growing depends more or less on the nature of the site, many growers will be interested in it.

In the April number, we shall discuss the "Preparation of the Soil and Planting."

Questions and Answers

There are plenty of wild grapes growing here. Could Concord be grafted on them and would they bear this year?

SAMUEL W. CARSON, Illinois.

Reply: Yes, Concord could be grafted on these wild grapes. The cions that live would begin to bear the second year. Unless one wished to do this for the fun of doing it, we would not recommend it. To be successful in growing grapes, one must cultivate and spray and that can be done only in the garden or vineyard.

S. J. B.

Last year I set out about 500 currants and raspberries. I set them out by digging a hole with a spade for each one, this took rather a long time but was quite satisfactory. Now I have almost seven acres to set out this spring and not having any experience in setting out large number, I write to ask your advice as to how to do this. I have heard of plowing a furrow and placing plants along the land side then plowing the ground back again. The currants are to be placed check row 5 by 6 feet. What would you suggest? How far apart should red raspberries be set and should more than one plant be placed in a hill? Should red raspberries be set in check row?

JESSE F. CORY.

Reply: With two horses and two-horse implements, we should plant both the currants and raspberries eight feet between the rows. Then plant currants and red raspberries four feet apart in the row and black raspberries three feet. This enables the grower to cultivate and-dise more quickly and cheaply and also to more readily remove the canes after pruning and to spray more effectively. We should mark the field out in both directions and use the spade method in planting as described in the strawberry article in the February issue. Plant only one good plant in a hill. The care will become less during the first summer if rowed in both directions.

S. J. B.

Editor of AMERICAN FRUIT GROWER: I have just been reading in your December number about the yield of Concord grapes. Your article says 60 bunches weigh about 15 pounds to each vine and you call that a large yield. I have 74

vines of Concord planted for shade over my ginseng beds; have never been trimmed and became badly infested with black rot. I sprayed five times this season and my crop amounted to 2,925 pounds or over 39 pounds per vine.

F. K. MORGAN, Seville, Ohio.

Reply: Your yield of grapes is interesting and indicates that my estimate is conservative rather than otherwise. Of course, in my article, I was speaking of average yields under ordinary vineyard conditions. You are doing the correct thing by cutting away much of the wood on your vines. You will find that they will respond with larger and better fruit and give you less trouble in your efforts to control the black rot. At the same time, the fewer shoots will grow longer and give you plenty of shade for your ginseng.

S. J. B.

MORE AND BETTER PEACHES

By John C. Johnson, California

"Give the consumer the best you can produce. Remember when you please him you profit yourself. Housewives of America are becoming more aware every day of the value of peaches for the family table in the out-of-season months. They want more and better peaches."

This is the message the California Peach Growers, Inc., the great co-operative marketing organization of central California, will send forth to its grower members in opening a great educational campaign for the raising of "more and better peaches." It is in answer to the insistent demand that overwhelms growers every year. The peach growers' organization will launch the big educational movement for the purpose not only of answering the market demand, but to convince the grower that when his best efforts are given toward peach growing, the dried peach market will be re-established on a basis never before enjoyed.

The grower will be given the opportunity to learn every scientific means necessary for the success of his orchard. He will be furnished with data on all practical methods, and a corps of fruit experts will be at his command. In fact the entire knowledge of the great peach association along growing lines will be at his disposal.

In this big movement for re-establishment of the growers' interests, the Fresno County Chamber of Commerce, the livestock boosting organization in central California, has pledged its active support. The chamber is now helping in the preparation of plans for the big work.

Ignorance is the mighty factor that is impeding the progress of the grower, according to authorities. One of the significant reasons for waging the campaign is to get growers to abandon the practice of pulling up peach trees that have reached all degrees of maturity and replanting on the land some other fruit or crop. The grower has not profited by his negligent methods and hence he considers peach growing a losing proposition. It is just for this purpose that the peach growers' organization will start out on a vigorous campaign to re-establish the grower's end.

Co-operative Peach Growers

Since its inception in the richly productive San Joaquin Valley, the California Peach Growers Inc., a co-operative organization of character similar to the California Associated Raisin Co., has enjoyed great success in stabilizing the market, getting a fair price for the grower and selling to the trade at a fair price. The association's members are enjoying the best of success by marketing their crops through this organization, which has already proved, after a comparatively brief period of operation, its tremendous value to the California dried peach industry.

But as there are still some members who do not know yet the value of practical growing methods, the association cannot attain complete success without the full-fledged support of its entire membership. Hence it will endeavor to reach every one of its members with some improved form of instruction for raising "more and better" peaches.

Under war conditions last year every member of the association got the best possible returns for his crop. The crop, which was considerably below normal in size, was sold out in short order. Fortunately, as a result of the persistent efforts of the association offices to improve the quality, the 1918 peaches were exceptionally high grade. This offset to some extent the disadvantage of a short crop.



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Every Orchard should have a windbreak. We have an immense stock of thrifty Evergreens—all leading varieties. Our Thunberg's Barberry and California Privet excel for lawn hedges. Flowering Shrubs for the lawn.

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Send the coupon for the book that shows in detail wherein the BEAN excels. It costs nothing to get it. Every grower can buy more wisely with its help. Also describes famous Bean Spray Gun, with which one man does two men's work. Takes full capacity of largest sprayer through one line of 3/4-inch hose.

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FRUIT GROWERS find the Trailmobile the most economical means of hauling fruit and supplies. It costs less than any other equipment that will do the work.

Drawn by a passenger car or light truck the Trailmobile does the work of from three to six teams; it saves four or five drivers; it adds only 10 per cent to the cost of operating the car or truck; it lasts for years and requires practically no up-keep expenditure.

It supplies fast, inexpensive transportation from the orchard to the railroad. It makes possible trips to distant city markets, saving packing expense and commissions.

The Trailmobile is built like a truck with truck axles, springs and bearings. Runs many times more easily than a wagon and saves gasoline. Tracks perfectly and doesn't sideways.

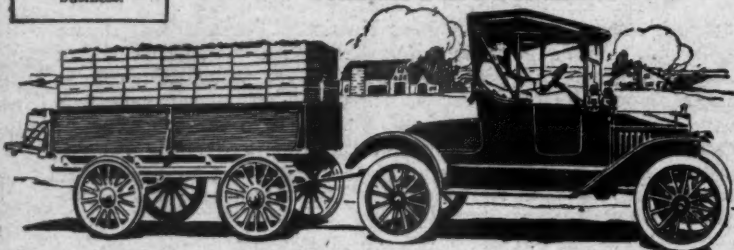
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Northern Indiana Orcharding

By H. H. Swaim, Indiana

THREE essentials in present day orcharding are pruning, spraying and cultivation, and each is equally important if you would produce a grade of fruit which the market demands.

The story of these operations, as practiced by a successful Hoosier orchardist, is both interesting and instructive. We have heard much of the southern Indiana apples and the wonderful orchards on her sun-kissed hills, but we are now going to shift the scene to the fertile farming lands of the northern part of the state.

Not far from the town of Denver, in Miami County, are located the Doud orchards consisting of 1,400 bearing apple trees and 1,500 young trees just coming into bearing. The manager, Mr. L. V. Doud, is a young man full of pluck and energy, who gives the work his personal supervision.

burned, two men and a team, with a flat rack on a low truck, doing this work very rapidly.

Starts with Dormant Spray

The dormant spray is delayed as late as it can safely be done, usually about the last of March or the first of April. Lime-sulphur solution is used for the dormant spray and is applied at a strength of 50 Baume. This spray is followed, just as the buds are bursting and before the blossoms open, by a dilute lime-sulphur solution testing 10 Baume combined with arsenate of lead in the proportion of one pound of the powdered form, or two pounds of paste, to fifty gallons of the solution. In order to destroy aphids, which may be present, he also includes one-third pint of nicotine sulphate in this spray. This same solution, with the omission of the nicotine, is used in the application for codling moth which is



The Clark Cutaway Harrow is Excellent for Cultivating the Orchard

How Pruning is Done

All the bearing trees are given a moderate annual pruning, thinning out the outer branches to allow the sunlight to penetrate to the center of the tree, but using extreme care not to destroy the fruit spurs upon the larger limbs.

This work is done by a crew of four to six men directed by Mr. Doud who works with the men. The principal tools, used in pruning, are a good type of pruning saw and a pole pruner for heading back. Mild days during the winter are taken advantage of to get this done before the rush of spring work.

The young trees are not trusted to the tender mercies of the hired man but the manager gives them his personal attention; heading them low, allowing no forks to form, and distributing the trunk limbs at proper distances. The pruning knife and shears are the only tools necessary for these young trees. As soon as the pruning is done the brush is removed and

made immediately after the petals fall. In this latitude one more application, in about two or three weeks, is all that is usually necessary to get clean, marketable fruit. In his spraying operations the points Mr. Doud insists most strongly upon are, satisfactory strength of material and thoroughness of application.

As a means of conserving time and keeping down expenses, a well and windmill with storage tanks are located near the center of one of the largest orchards, and similar supplies are provided convenient to the others. A triplex pump, run by a gasoline engine, is used for the spraying. One nozzle is handled from the tower on the machine, throwing the spray down from above, while two men working from the ground cover the lower branches from below, thus by systematic team work a saving in labor and material is effected.

Thorough Cultivation

The plow is started as soon as the ground



Showing Tank and Engine Housing Over Creek as Handy Equipment in Spraying Vegetables and Fruit. Vegetable and Fruit Dryer with Spray Tank at Right

is in condition to work, using one horse and a plow with adjustable handles and beam, and finishing the land between the rows with a team and two-horse plow. An extension orchard disc and leveling harrows follow at regular intervals until the time for sowing the cover crop, about the first of August. Thinning the fruit is practiced to a considerable extent, especially upon the early apples, thereby increasing the size of the fruit and preventing overloading of the trees.

Packing and Marketing

All fruit is carefully picked, sorted and graded before it is sent to market. The condition of the labor market last year led to the employment of women to assist in the picking, and proved very satisfactory. They were given the ground work, using half bushel baskets; they picked all they could reach conveniently and were followed by men with light pointed ladders, who gathered the fruit from the higher branches, using picking sacks which were emptied into bushel baskets.

These are loaded upon a low wagon fitted with bolster springs, and hauled directly to the packing house, where they are carefully sorted and graded with a machine grader. The fruit which is sold in the local market is packed in bushel baskets, but for the shipping trade barrels are used. Fruit that is to be stored is loaded at once into cars and rushed to the storage. While using every care to pack the fruit in an attractive manner a strictly honest pack is insisted upon for every barrel of apples that goes through the packing house. When necessary the culls are made into cider, but for the past few years they have all been sold at the packing house for home consumption.

This and similar enterprises in the northern part of the state are demonstrating that apples can be grown successfully as a commercial crop in this section of Indiana.

IT PAYS WELL TO STORE ICE

By M. D. Underwood, Illinois

Having found the past few summers, the comfort of living greatly enhanced by having an abundant supply of ice, I shall certainly do my best to fill the ice house again this present winter. Not only is the matter of family convenience and comfort a consideration, but we have been able to render important aid and benefit to our neighbors in time of sickness. With a supply of ice constantly on hand during the summer, fruits, fresh meat, dairy products and other provisions may be kept in good condition for weeks, where otherwise they would spoil in a short time. The boys and girls and old folks too crave ice cream, lemonade and other homemade delicacies which may be served every hot day where ice, eggs, cream, etc., are at hand.

I filled my ice house last winter at a cost of not more than \$15. The ice lasted until well into October, when the weather was cool enough to dispense with the use of it. During the entire summer season we had an abundance of cool water to drink and in addition kept fruits and other food products cool, fresh and sweet. During the hot weather there chanced to be some cases of protracted illness in the neighborhood, and we were glad to be able to give the sick many pounds of ice. Before I commenced to store ice, my ice bill was about \$30 a season, so that as an investment the ice house has paid well. Why cannot all fruit growers and farmers put up a good supply of ice? I am sure that in the long run no other similar investment of time, labor and money will make better returns.

The construction of a house sufficient to hold ice is not an expensive matter. The building should be so located that it will be near the dwelling and protected by shade trees, if possible, during the heat of the day. Good drainage is also an item of much importance which may be obtained by a filling of gravel or proper grading in and about the building. The walls should be double, with a six-inch space between the boarding. This may be packed with sawdust or some other non-conductor of heat. Clover chaff may be substituted for the sawdust provided the boarding is made with matched lumber on the outside of the building.

If there is a portable sawmill in the neighborhood it will make material for the frame and inside boarding. In the absence of a mill the material will of course have to be purchased from a dealer. Sawdust should be obtained for packing the ice and the ice should be cut and packed when the weather is below or around zero. This pre-

caution will aid its keeping qualities and at the same time prevent a possibility of the blocks freezing together from dripping during the process of packing. Clean snow is also an excellent material for filling between and leveling the blocks of ice as they come into the ice house. No open spaces should remain unfilled because they may become connected with the air outside and thus the ice will melt away quickly about them.

Sawdust Best Packing

Six to ten inches of sawdust should be firmly packed between the ice and the inside boarding. Chaff is sometimes used for this purpose but it is not equal to sawdust as a non-conductor of heat. The mass of ice should be covered with at least twelve to fifteen inches of dry, clean sawdust. This matter is a very important one because good ventilation must be provided, otherwise moisture will accumulate over the ice which is a decided disadvantage to its keeping properties.

Other means may be used to keep ice and no ice house need be built. But I think it is best to build a house as one is then sure of the ice keeping properly. I have known men to simply pile up a big heap of ice on straw, laid poles on a slight elevation, covering the ice thickly with straw, and it seemed to serve nearly as well as a house. A neighbor kept ice the entire season on the north side of his barn. He left a space of about two feet between the side of the barn and the ice and into this packed straw good and tight. He then covered the pile with a thick roofing of straw so as to shed rain.

ORCHARD TREE PRUNING

By Daniel Leatherman, Indiana

There is nothing more important in orcharding than tree pruning, yet many orchardists do not seem to realize it. In this latitude (northern Indiana), the latter part of March is the time when pruning should be done, especially when heavy pruning is required as is the case where many old and decaying trees are to be rejuvenated by the removal of large limbs. All dead or nearly dead limbs may then be taken off, and a few others where most crowded. Further work should be deferred until the following year. For thinning out branches merely, the work may all be done the first year.

The main principles to be held in view in tree pruning are the thorough airing of the tree, and the admission of sunshine to all parts of it. This always favors the healthy growth of both wood and fruit. The cutting should be made as close as possible to the body of the limb, using either a sharp knife or a fine-tooth saw for the purpose.

In a large tree that has had little pruning, much wood will thus be brought down, and as the clipping is distributed throughout the tree, and is confined to twigs and small limbs, there will be no perceptible shock. We would advise the withholding of manure the year this is done, as an excessive growth of wood is liable to result at the expense of fruit.

Balance Between Wood and Fruit

In all work with fruit trees it should be kept in mind that a balance between the wood and fruit growth is necessary for best results. There are many things that affect it, such as manuring or cultivating the soil, pruning and thinning out the fruit.

The pear tree makes more branches than the apple, and therefore needs much closer attention. The limbs should not be allowed to interlace each other. Bearing trees often have their branches brought out of shape by the weight of fruit, and it is advisable to prune such trees in such a way as to give a good outline.

The cherry needs little pruning after the first year or two, and in fact what it needs at first is but a little to give the tree a good outline. It is unwise to cut it much after it gets large, as it heals slowly, and with old trees, sometimes not at all. For the same reason care should be taken not to bruise the bark of the tree.

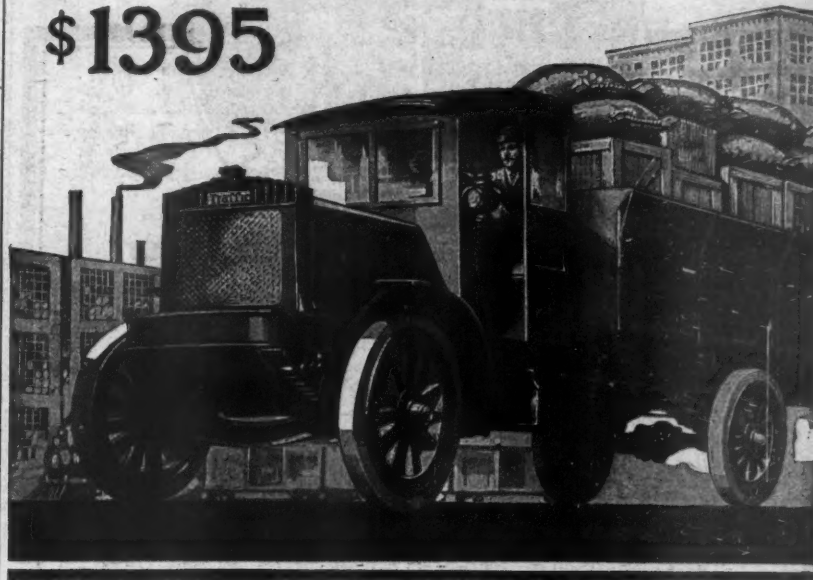
Peaches and apricots are but little pruned by the average fruit grower, and yet few fruit trees are more benefited by it. If there is no young wood there will be no fruit. If they are pruned a little every year, there is young wood over the entire tree, from near the ground to the top.

The plum has nearly the same requirements as the apple. Fewer branches, permitting of more air and sunlight, would bring more and better fruit to many a tree.

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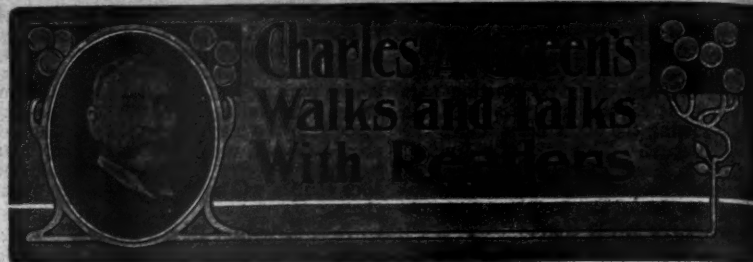
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Causes of Disastrous Fires

STATISTICS show an alarming loss by fires in homes and other buildings, through-out the United States. The causes of fires are many. Defective stove-pipes and chimneys, explosive matches that have dropped upon the floor and which ignite when stepped upon, defective or unclean kerosene lamps are perhaps the principal sources of fires. Spontaneous combustion is the cause of many fires. If you saturate cloths, paper or shavings with paints containing linseed oil, or saturate with linseed oil alone, and confine them in a bundle, box or barrel they will ignite by spontaneous combustion and burn the building. Strokes of lightning cause more fires than is generally supposed. Last August when I was coming into Rochester on the railroad train I saw a large building burning that was struck by lightning and totally destroyed. Though I did not know it at the time, another building just a little way beyond owned by Green's Nursery Company was struck by lightning and was burning, and about a mile farther distant a large grain barn was struck by lightning and destroyed, making three expensive buildings in a row struck by lightning in one afternoon and totally destroyed. Fires are caused by furnaces located in cellars being left on through forgetfulness while the residents are absent, thus overheating the registers, which come in contact with the wood or carpeting.

Hot ashes dumped into wooden boxes or barrels cause many fires. Smokers of pipes, cigars or cigarettes are always dangerous. No matter how careful they may be they are liable to set buildings on fire. Even the most careful smoker may lay down his pipe or cigar and, becoming otherwise occupied, forget about it. Then it may be blown off by the wind, or brushed off, and set the building on fire. I have known of this in many instances.

Eternal vigilance is the price of safety from fire. I have formed the habit of going around the house just before retiring for the night, inspecting the furnaces, stoves, cellars and the various rooms.

Fruit Trees on Low Lands

I am often asked about the advisability of planting small fruits or orchard trees on lowlands. My advice invariably is to plant on the uplands in preference to the lowlands. I do not mean by this that you must seek steep hillsides or hilltops. The difference in elevation of 4, 5, 10 or 20 feet makes a vast difference in the productiveness of an orchard. I have known grapevines to be cut down by late spring frosts that were only a foot or two lower than surrounding vines that were not injured by the frost. A slight elevation gives better drainage of the soil. Trees planted on lowlands make rapid growth but are not so likely to be long enduring and fruitful. There is far greater danger of injury by late spring frosts and by frosts in the fall on lowlands than on uplands.

But bear in mind that I am speaking of soils in the eastern and middle states. There are sections of the country where fruits succeed even better on the lowlands than on the uplands.

One Dollar a Day

During a recent vacation I saw a little girl about seven years old sitting on a bench at the farthest end of a golf course. By her side was a pail of water and a basket of red-cheeked apples. As the men playing golf passed this child nearly all of them took an apple and a drink of water and placed upon the bench a nickel or sometimes a dime. I was told that this child often takes in a dollar a day for this service. How many families there are located like this little girl who have not thought of making money through their proximity to a golf course or some other park or playground. How

tempting would be a basket of ripe peaches, grapes, apricots, pears or plums to thirsty or hungry people (even a few cookies might be tucked into a corner of the basket). These purchasers would not be likely to haggle about the prices they paid. If there is no particular gathering of people near your farm, as was the case in the golf club, you have left the opportunity of putting up a placard or sign near your house, stating that you have ripe peaches, apples, pears, plums, fresh eggs or other farm products for sale in small or large amounts and let one of the children take charge of this place.

Blackberries

When my attention is called to the subject of blackberries my thought always reverts to the wild blackberries which I gathered when a child on the homestead farm. Those wild blackberries of the early days were of large size. Why is it that the wild blackberries of today are so small, hard and seedy? The answer is that there have been changes in the character of the soil. In old times the falling of the forest leaves and their drifting into the hollows where the wild blackberries grew, made an ideal mulch, holding the moisture which the blackberry requires for fullest development.

One day while roving about I discovered that the wild blackberries were dead ripe and that the bushes were loaded down with large sweet berries. Being barefooted, I had difficulty in progressing, but finally clambered over the trunk of a fallen tree that lay through the center of a small wild blackberry patch. After eating my fill I was wondering how I could carry some of these berries home. Luckily I was wearing an old-fashioned straw hat, something the shape of what is called a stove-pipe silk hat with a very high crown. I made use of this hat to carry home fully six quarts of blackberries.

Most people pick blackberries and eat them when they are green though black. A great enthusiast over the blackberry has said that these berries should not be picked until fully ripe, when the bees and wasps begin to feed upon their juices. A row of blackberry bushes through the garden is a great attraction. If you would give them their ideal treatment you will place around the bushes a mulch of stable manure which will keep the soil moist and largely increase the crop.

Do Our Orchard Lands Need Enriching?

The answer is "Yes," many of our orchards do need enriching. If the trees are making but little growth, if the fruit produced is inferior, the suspicion is that additional fertilizers should be applied in the way of barnyard manure or commercial fertilizers. The plant foods most necessary for orchards are potash and phosphoric acid.

Orchards growing on good farm soil such as will produce a good crop of corn, wheat or potatoes may not need enrichment by the application of fertilizers of any kind. The amount of fertility contained in such soils as mentioned above in the way of potash, phosphoric acid and other important ingredients is astonishing, the first foot of soil in some instances containing 30,000 pounds of potash, 3,000 pounds of phosphoric acid and 7,000 pounds of nitrogen, but a large portion of these fertilizing elements are not available as plant food. The way to make these plant foods that exist in the soil available is through cultivation and through the action of rains and frosts, therefore our orchards are more in need of cultivation than of the application of fertilizers.

Notwithstanding the above, if you are in doubt rest assured that the application of stable manure or other fertilizers will do

no injury to your orchard if applied in reasonable quantities. Stable manure is particularly desirable since it makes the soil more porous, acts as a mulch and has humus, all of which are desirable. It is safe to claim that many orchards need tile draining more than they need additional fertilizers.

At Green's Fruit Farm I have noticed that the apple trees growing on the higher part of the field and drier part produce larger and better fruit than those on the lower levels of the same field where drainage would be most effective. If there are any scabby apples you are likely to find them on the lower level and not on the trees on a higher elevation.

A Tree As a Friend and Relative

I have come to think of trees as friends not only in the way of furnishing something to eat which is healthful and enjoyable, but in their beauty and in the attractiveness of their shade during the heated season. Who can gather fruit from a tree for 10, 20, 30 or 40 years without having a friendly feeling toward such a tree? With me this tree becomes almost a member of the family. I have in mind an old cherry tree at least 50 years old that has not been known to miss a year of productiveness. How well this tree has paid for its occupancy of a place on the lawn in front of my house! There is not a penny of expense incurred for cultivation or spraying or fertilizing and yet the crops are abundant and the fruit delicious. Near this cherry tree was a Baldwin apple tree that also furnished a bountiful supply of fruit without expense. One year it produced 12 barrels of beautiful apples. A hurricane finally broke down nearly all the branches and the tree perished. Myself and family felt as though we had lost a friend and relative.

Thinning Fruit

S. D. Willard, a noted and successful western New York fruit grower, now deceased, was once asked at a horticultural meeting what his experience was with thinning fruit. His reply was as follows: "When the fruit of the peach, plum, apple or pear is of suitable size I send my men in to cut out half of the fruit from each tree. A few weeks later if the fruit has not fallen seriously, I send my men in again to cut out one-half more of all the fruit upon each tree. Later I send in my men to cut out one-half of that which remains on each tree. Then still later I send my men in and cut out all the fruit that is left."

This is certainly a very amusing statement, displaying the wit of our oldtime friend Willard. What he intended to teach by this was that most fruit trees set too much fruit and that it is not easy to overdo the thinning process.

My opinion is that the thinning of fruit is an expensive operation, requiring skill and experience. The novice is liable to make serious mistakes in thinning fruit. It is difficult to give rules in writing as to when the trees should be thinned and how seriously the thinning should be made.

An Acre of Strawberries

I am asked to give advice about the planting of an acre of strawberries. My friend inquires: 1. What time is best for planting? 2. How far apart should the plants be set? 3. Which is the best way, hills or rows? 4. Should strawberries be planted on level ground or upland? 5. What is the best variety for shipping? 6. Do you advise planting the monthly ripening varieties or the everbearing raspberry plants? 7. Do raspberries have to be staked?

1. Early spring is the best time to plant strawberries for the market. For home use strawberries can be planted almost any time of year that you can secure the plants. 2. I favor planting in rows 4 ft. apart with the plants 18 inches apart in the row. 3. I do not know of anyone who grows strawberries in hills for market. Planting in rows is considered preferable for market. 4. There is no objection to level ground provided it is not lowland. I do not advise planting strawberries on lowland owing to the danger of late spring frosts, which are far more serious than on uplands or on side hills. I would not plant on steep hillsides or sharp hilltops.

5. I dare not attempt to answer this question. There will probably be many varieties offered as candidates. Strawberries are peculiar inasmuch as certain varieties do remarkably well in certain localities and not so well in other localities.

6. Yes, I grow everbearing red raspberries and everbearing strawberries but

I have never considered them so valuable for market as the varieties that ripened only in season. Never plant everbearing strawberries and raspberries for market.

7. When properly pruned or cut back, raspberries and blackberries do not need staking. Staking is expensive and unnecessary and is practiced only in home gardens.

An acre of strawberries will require about 10,000 plants for the planting.

If you have no experience in growing strawberries, I advise you to begin in a small way. Do not plant an acre at once. Limit yourself to $\frac{1}{4}$ -acre as you have much to learn and can learn nearly as much by handling $\frac{1}{4}$ of an acre as you can by planting an acre or 10 acres. If you have experience in strawberry growing you can plant any quantity desired, but generally the moderate sized plantation is the most profitable.

Dwarf Pear Hedge Row

Chas. A. Green: You have been very naughty to give up Green's Fruit Grower, although your monthly letter kind'er makes me feel you're around yet. As for that hedge of dwarf pears, the varieties of pear are so very different in manner of growth that any hedge would have a heterogeneity. For instance, how would a Seckel and Clapp look together or a Rostiezer and Buffam? And yet one wouldn't want all alike in fruit. I suppose a Lawrence, Seckel, Dana, Heathcote, Ott and Guis would all go together and the Vigalieu, Duchess and St. Michael, and Assumption and Buffam and Gifford, St. Ghislain and Rostiezer. Wouldn't that hedge look funny? I have planted $7\frac{1}{2}$ feet apart, dwarfs, and find that each tree that way shows its distinctive beauty. My grandfather has a Nigger pear that I have grafted and brought with me from Oyster Bay, with large shiney leaves and very large blossoms in bunches, that I shall cultivate as a lawn tree. But really pear trees are not very pretty lawn trees. The Superfine is pretty good. Now an apple tree is pretty, a Fameuse for instance, or Arkansas Black. And some grapevines are beautiful for three months out of the twelve.

C. A. Green's Reply: The row of dwarf pears through my vegetable garden was planted 3 ft. apart. It is true that different pear trees often differ in vigor of growth and would not present an attractive appearance unless the heads were cut back each season. This cutting back I do early in the summer, say in July, when I shear off the top of the pear hedge row much as I would shear off the California privet or barberry hedge row, and thus keep the tops uniform in height. One object in cutting off the tops of the branches in early summer is that the young wood is soft then and the shearing can be done with greater ease than when the wood has become hard in early winter.

This annual cutting back of the shoots causes early fruiting of the pear trees or any other fruit trees. We discovered this fact with emphasis in the management of a row of Anjou pear trees. The new growth was removed from a large portion of these pear trees for the purpose of budding. We discovered that the cutting back of the branches produced early and uniform bearing on the trees cut back, whereas other trees in the same row not thus cut back did not bear so early or so abundantly.

My correspondent speaks of the dwarf pear not being ornamental in the lawn or grass plot, but my opinion is that it can be made ornamental by free use of the pruning shears by cutting back the top branches and the side branches, making the tree compact and with a well rounded head and low branches.

Many people are surprised at what can be done in the way of shaping a large or small fruit tree by continuous pruning, something the way hedges are pruned by shearing off the new growth in July. This pruning or shearing gives you more than twice as many shoots and fruit buds.

One great mistake in the management of dwarf pear trees is in not heading back the top branches. I would cut back the side branches also at least once a year. This keeps the tree a dwarf as it was intended to be. If the top shoots or branches are allowed to grow rampantly without cutting back, the dwarf pear tree will soon look like a standard pear tree and will be likely to be blown over by its topheaviness in autumn gales.

Duchess pear is one of the strongest growing dwarfs. Clapp's Favorite might come next. Worden Seckel and Seckel, Howell, Lawrence, Anjou and Wilder Early are slower growers.

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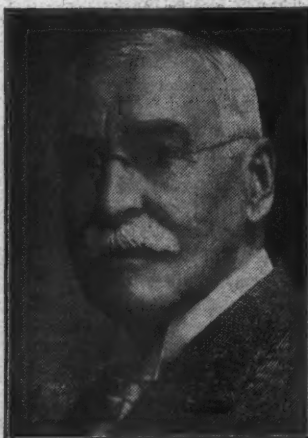
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New Department on "Nuts"

By Dr. W. C. Deming, Washington, D. C.

AT THE very beginning of the "Nut" Department which the editor has asked me to conduct I want to make this plea. You have heard of the proposal to plant a tree for every American soldier who crossed the ocean to fight for our ideals and the liberation of the oppressed. I want to ask that these trees that we are going to plant shall be nut trees. I have just seen a picture of a mother and her two small sons planting a tree for a soldier. But the tree was a silver maple, symbol of beauty, uselessness and short life. Not the symbol for a soldier. If it had been a sturdy black walnut, shagbark hickory or pecan it would have been equally beautiful, much longer lived and have borne each year a crop of useful fruit the gathering of which would have revived fresh memories of the soldier in whose honor it was planted.

Two millions of our boys have crossed the Atlantic. But I am not so optimistic as to think that we can hope to have that many of any kinds of trees planted in their memory in one year, though to be sure two million nut trees would be only a beginning of the number that should be planted over this great country of ours. Let us ask for a modest ten thousand nut trees this year and hope for better results to come. If you will plant even one nut tree for some soldier boy that you know write to Mr. W. G. Bixby, secretary of the Northern Nut Growers Association, 32 Grand Ave., Baldwin, Nassau Co., N. Y., for their accredited list of nut nurserymen who can furnish grafted nut trees of improved varieties, send for their catalogues and set a tree that will be a joy to you for a lifetime and a fitting memorial of a brave man.

Start at the Beginning

A "Nut" Department at the outset should begin at the beginning because there are so few people who have given any thought to nut growing or know any more about it than that some nut trees bear better nuts than others and that you can get better nuts, as a rule, at the village grocery than you can in the woods. Let us consider these two points for a moment.

Practically all of our American nut trees are wild seedlings. A few of them bear such fine nuts that the boys will go miles to get what the wise squirrels have left, if any. But most of them bear such poor nuts that even the squirrels will hardly gather them. The same was once true, a long time ago, of all our fruits, apples, pears or peaches. But man, through the ages, has gradually picked out the best of these other fruits, that were mostly once chance wild seedlings, preserved them for his own use by grafting them on seedling stocks, and we now have our Baldwin apples, Bartlett pears and Elberta peaches. You can still find in our unused land and in fence corners many examples of wild seedling trees bearing worthless fruit.

What has been done for these fruits has not yet been done for nuts. In spite of the fact that for some years a few men have been searching for our good native nut trees, propagating them and planting them in a limited way, it still remains true that our best native nuts have not been selected, propagated and planted generally on our farms as have our other fruits. The one exception to this is the southern pecan, and it is a wonderful and glorious exception and the best possible example of what can be done with nuts and a splendid encouragement and stimulus to all who have nut growing at heart. In the last twenty-five or thirty years a few devoted nut enthusiasts of the Gulf states have so developed the pecan native in that part of the country, by selection and propagation, that already in a limited area of the south pecan culture is a prosperous and growing industry with many thousands of acres set with orchards of grafted trees bearing pecans that many believe to be the finest nuts in the world and that retail in our markets at from fifty cents to a dollar a pound in the shell. Any one who is familiar with the Schley pecan knows that it would be difficult to name a finer nut or a better example of sweet, delicious, concentrated and wholesome food.

Opportunities are Here

What has been done with the southern pecan can be done with other native American nuts.

The reason why we can buy better nuts at the village grocery is that most of these nuts come from over the seas from old world countries where through many centuries the improvement of their native nuts has been going on just as the pecan here has been improved, though American methods have made much quicker work of it. The big English walnuts, chestnuts, filberts and almonds that are imported and that we can buy were developed by man's selection from native nuts of the European or Asian forests whose general run was as variable, small, thick shelled and hard to crack as is the general run of our own native nuts. It is true that we now get many of our best English walnuts and almonds from our own Pacific Coast but they are not native American and the industry of growing them is one transplanted from the old world.

Now in laying so much stress on the development of the nuts of other countries, and the comparatively slight development of our own, I do not want any man to feel discouraged about nut planting right at home or to think that he must wait for their further development before doing so. On the contrary we already have selected varieties of the northern pecan, the shagbark hickory and the black walnut that are very good nuts and of which you would be glad to have many bushels stored in your cellar to your great pleasure and profit. The only trouble is that people don't know about them and haven't yet planted them. There are other fine nuts as well that we can grow, like the English walnut and the filbert, that are not native American.

The point of these remarks about our native nuts is that although we already have fine varieties there is every reason to believe that there are still finer ones in existence that have not yet been brought to notice.

Therefore the second plea that I wish to make, and with which to end this article is that people who know of native trees bearing fine nuts will let some of us know about them before the trees die or are cut down and their value lost forever to mankind.

In later articles we will consider what are the characteristics of good nuts, their value as food, their commercial value, the importance of tree crops and why nuts are the best of these and, after these more general remarks, consider the different nuts and the best conditions for growing them.

I hope that the readers of the AMERICAN FRUIT GROWER will wish to ask questions about nut growing and I will do my best to answer them.

PLANT AN ACRE HOME ORCHARD

By C. H. Heard, Iowa

It Should Include

Apples, pears, peaches, plums, cherries, grapes, raspberries, blackberries, strawberries—every kind of fruit that will grow in your locality.

It Should Be Planned

1. To afford a succession of ripe fruit throughout the season. Use early, medium and late varieties.
2. To include only standard varieties. Consult successful growers and also your State Experiment station.
3. To allow proper distances between plants.

It Will Require

1. Cultivating.
2. Fertilizing.
3. Pruning.
4. Spraying.

It Will Afford

1. A succession of the best quality of fresh fruits in season.
2. Canned and preserved fruits the year round.
3. A necessary and healthful portion of the diet.
4. An efficient means of reducing grocery and meat bills.
5. Some profitable work during the winter months.
6. An important supplementary source of income.
7. With plantings of trees and shrubs will afford ideal home conditions in an otherwise unattractive farm.

Grower Nuts"

Meeting of Missouri Horticultural Society

By V. R. Gardner, Missouri

The Missouri State Horticultural Society held its annual meeting this year the week of January 20th, at Columbia, Mo., in connection with the horticultural program given Farmers' Week by the University of Missouri. The meeting was well attended both by growers from the state and by a number from adjoining states. Though a limited amount of time was devoted to other branches of horticulture, the fruit industry and particularly the apple industry seemed to be the center of interest. In this connection, it is interesting to note that the general question of the control of orchard insects and diseases through spraying methods, occupied the most prominent place on the program. This is interesting in that it reflects the opinion of the growers as being the most important question with which they have to deal at the present time.

Commercial growers are not asking whether they shall or shall not spray, for that question is already settled in their minds. But they are interested to know just what materials may be used to best advantage, and at what particular time. This attitude on the part of the commercial growers indicates that they appreciate the direction in which the fruit industry is moving. They are adjusting themselves to changing conditions and this means that the fruit industry in this section of the country has a brighter future than it ever had before.

One point worthy of note in connection with the meeting of the Missouri Horticultural Society is that throughout the discussions there was a spirit of optimism for the future of the commercial apple industry of this section. It was not because there was any tendency to minimize the importance or the seriousness of the problems with which they have to deal, but there was an under current of confidence in their ability to deal with these problems and solve them satisfactorily. Commercial growers have had a successful year and they are looking forward to a series of prosperous years in the future.

There was an attractive display of apples from a number of different places in the state. Especially attractive exhibits were made by T. J. Sweitzer & Son of Springfield, Mo.; Waverly Fruit Growers Orchardists, Waverly, Mo.; C. C. Bell of Booneville, and G. M. Fette of Hannibal, Mo.; The Stark Bros., of Louisiana, Mo., also contributed an attractive exhibit of the Delicious apple. New officers elected by the Society for the coming year are:

President, S. S. Connett, St. Joseph; honorary vice-president, C. H. Dutcher, Warrensburg; first vice-president, H. C. Irish, St. Louis; second vice-president, F. B. Mumford, Columbia; third vice-president, E. L. Beal, Republic; recording secretary, H. S. Wayman, Princeton; treasurer, Daniel Lowmiller, Parkville.

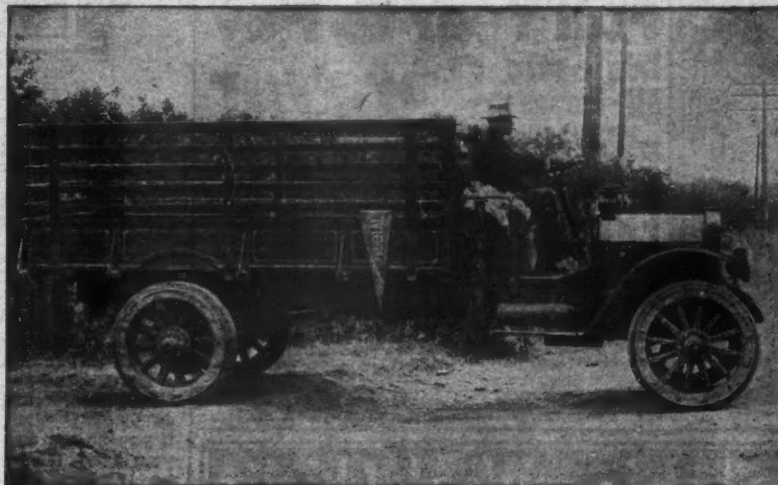
On the last day there was held a joint meeting with representatives from the State Nurserymen's Association. The two organizations perfected plans for presenting the horticultural interests of the state to proper committees of the state legislature.

THE MAN'S PRAYER

We may not be able to sit at the table,
And smile when the deal goes astray;
We may lose our punch when a favorite
hunch,
Falls down with a minute to play;
But Lord of the fighters, don't make us
blighters,
Who stop when the road climbs a hill—
Give us strength to keep on when the last
hope is gone,
And to sit in the losing game still!
We may lose our nerve when the racing cars
swerve;
We may not enjoy the knock-out,
We probably cry when the big chance goes
by;
We may only run in a rout!
But Lord of the winners, forgive us poor sin-
ners,
Who wait at the training you send,
Make us stand for the ship with a stiff upper
lip,
For the strength to win out in the end!
—From the The Fruit World, Australia.

Some farmers never think of painting their farm machinery. They should remember that paint is not only a beautifier but a preserver.

"Return loads will cut
your haulage costs."



Another
FEDERAL

This Federal markets
fruit promptly for J.
L. Campbell, Newcastle,
Cal.

When Part of the Fruit Crop Spoils

You can't stop fruit from spoiling, but you *can* "beat nature to it," by marketing your product with a Federal truck before decay has a chance to work its havoc and steal away your profits. This cannot always be done with a team, especially in the rush of fruit season.

When part of a crop spoils in the fruit-grower's hands the answer can nearly always be found in his means of transportation.

For marketing his apple crop—1000 bbls. annually—J. F. C. Bryant, of Dover, N. J., finds his Federal truck invaluable. He declares it has done work he could not have thought of doing with a team, and has saved him money. In two years constant use it needed no repairs—not even new spark plugs. This example of Federal usefulness is one of many.

"Traffic News"—a magazine for the truck owner and buyer, will be sent to your address if you will write us.

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Full Year to Pay Majestic All-Purpose Sprayer

This hand sprayer is just what you want if you haven't enough work to keep a power sprayer busy. Working parts made of best. Specially constructed pump with high grade 4-ply rubber tubing. Automatic shut-off nozzle with non-clog spring cap. Light convenient. Easily taken apart for cleaning. Contents kept continually and thoroughly mixed. Sprays to the last drop.

FREE Book of Farm Necessities
Shows wonderful bargains in cream separators, drills, cultivators, saw frames, circular saws, feed cookers, incubators, brooders, paints, roofing, etc. Write postal for free copy.

SEND coupon today for this sprayer and take a full year to pay if you like it. Just the coupon. No money.

THE HARTMAN COMPANY
4015 LaSalle St., Dept. 1789 Chicago
Send Sprayer No. 687TMA40. If satisfactory I will pay \$1.20 in 30 days; balance in five 60 day payments of \$1.15 each until price of \$6.95 is paid. Otherwise I will return it in 30 days and you pay transportation both ways.

Name.....
Address.....

Stop Hatching Weak Chicks

With Cheap Incubators

Remember it is not how many you hatch that counts, but how many you raise. Chicks that hatch out weak and wobbly, and live but a few days, mean nothing to you except trouble and loss. They make one sick of the poultry business. Most of the chicks you lose in the first two weeks die because they did not hatch out with enough vitality or strength for a good start.

Queen Incubators

Hatch Chicks That Live and Grow

The Queen is accurately regulated—taking care of a temperature variation of 70 degrees without danger. It is built of genuine California Redwood—very scarce in these days of imitation and cheap substitution. Redwood does not absorb the odor from the hatching eggs. Cheaper woods, and pasteboard lining in iron and tin machines, retain the odors, to weaken and kill the hatching chicks.

Start your chicks with a Queen constitution and they will make money for you. The Queen is not a cheap incubator, compared with many of the cheaply constructed machines on the market, but it is cheap in the long run. It will be turning out high percentage hatches years after the cheap machines have been junked.

Sold by dealers. Catalog sent free on request.

QUEEN INCUBATOR CO.
Lincoln, Neb.



Size
60-egg to 2000-egg
PRICES, \$12.00 UP

GIANT TOMATO-CUCUMBER-PEANUT-10c

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Early Spanish Peanuts—Earliest variety and a great Peanut for the North; easy to grow, enormous yield, and a few hills in your garden will be very interesting to show your neighbors.

Special Offer: I will mail one regular sized Packet of Tomato, Cucumber and Peanut for only 10c, or 3 Packets of each for 25c.

My new Seed Book of Garden Seeds is included free. Order TODAY.

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Poultry for Profit



By C. A. Langston, Editor of "Poultry for Profit" Department

Poultry Facts of Great Interest

The following correspondence from Mr. John Gilbert of Great Bend, Kan., and Mr. H. H. Johnson of Clay Center, Neb., touches most vital questions in regard to profitable poultry production. This correspondence and Mr. Langston's comments, should be read by all who are interested in making money from their poultry.—Editor.

A Letter From Mr. John Gilbert

Mr. H. H. JOHNSON,
M. M. JOHNSON CO.

DEAR SIR—In the AMERICAN FRUIT GROWER for January is an article on page 44 by C. A. Langston, Editor, claiming if you do not want non-laying pullets on your hands from fall to mid-winter, make up your mind right now not to carry over a single pullet hatched earlier than the middle of March, nor later than the last of April. Why will not pullets hatched in February and first of March make good; early winter-laying hens? Please give me your ideas in regard to this question, not for controversy, but that I may know from a man of experience, and oblige,

JOHN GILBERT.

A Letter from H. H. Johnson

Mr. C. A. LANGSTON,
AMERICAN FRUIT GROWER.

DEAR MR. LANGSTON—Received the enclosed letter. I have looked up the article referred to. I believe that most of us are inclined to write according to our local conditions. It would be, in my estimation, very mischievous to give people at large the impression that they should do all their hatching in March and April. The best laying flock of chickens that I know of was a hatch brought off the 15th of June. They were laying by Christmas and all during the winter. In another instance a June 20th hatch made a tremendous record, and hatches in February are good money makers. Our best customers, we have been in this business for a great many years, and our most pleased customers are people making several hatches a season, some of them as high as eight hatches. A couple of early hatches adds a good deal of profit at the end of the year when a customer figures up his income.

I am glad the AMERICAN FRUIT GROWER is making a success. The Western Fruit Grower at St. Joseph, when it was in its prime was one of the best pullers that we have had. It is like losing an old friend to realize the Western Fruit Grower doesn't exist. Also Green's Fruit Grower gave us good returns for many years and I hope the consolidation proves successful. I shall be pleased to render any assistance I can to its success.

I am sending out Old Trusty catalog under separate cover. It may be you have a few minutes' time to look it over.

Very truly yours,

H. H. JOHNSON.

Mr. Langston's Reply

Mr. Gilbert's appeal to Mr. Johnson for an opinion on the trustworthiness of what was said in the January AMERICAN FRUIT GROWER about right dates for hatching for pullets for fall and winter laying and Mr. Johnson's frank reply to the editor of the poultry department raises a question that should be of vital concern to all poultry keepers.

The question of right hatching dates, which was touched upon in the January issue, was given a fuller discussion in the February issue in connection with the "Early Hatching" program of the Department of Agriculture.

The advice offered in January and February issues, which was forwarded by Mr. Gilbert to Mr. Johnson for comment, was expressly addressed to those poultry keepers on farms and orchards who keep poultry primarily for eggs, this being the special class of poultry keepers the government is trying to reach. The advice therein offered was based upon the established

fact that farmers and fruit growers who market their products chiefly through country stores and hence get the wholesale price must have some eggs to sell when prices are high, that is, from December to March, if they are to come through the year with a fair profit.

Laying Pullets by November

If this point is conceded, the hatching of pullets for fall and winter laying must be arranged accordingly. As the only fowl that may be relied on to lay eggs in late fall and early winter, the period of high prices for eggs, is an early spring hatched pullet, poultry keepers in this line must have and maintain pullets for this purpose. As laying maturity should be reached in seven months in the heavier breeds, and six months in the lighter, the poultry keeper should bring off his hatches at dates that will afford these times conditions for growth and development. For the greater portion of the country March and April comprise the favorable dates. But this statement was accompanied by the warning that every poultry keeper should understand his own weather conditions with respect to late fall and winter temperature. Latitude alone does not decide what the weather conditions must be. California, for instance, has a weather calendar of its own, and the success which Californians have achieved in poultry keeping for eggs shows that they know their conditions. Mr. Gilbert in Kansas, and the more than nine thousand other subscribers in the great state of Kansas knows his weather conditions and hatches accordingly. He asks, however, why a February hatched pullet may not be relied on to make a good fall and winter layer in his district. Not knowing his conditions, a definite answer with respect to hatching dates can not be given. But this much can be said: Throughout many sections of the country September and October register almost summer heat at times, particularly September. In sections where such temperature may be expected, a February hatched pullet way of laying her pullet clutch in September and then going into a mild molt. And this molt is quite likely to stop egg laying. She then takes her place with the molting hens and does not come back into laying until January or February. In the interim, however, she has consumed about 15 pounds of feed worth 75 cents.

What Is the Poultry Keeper to Do

If this behavior of a February hatched pullet is so probable that good management advises against it, what is the poultry keeper to do. Mr. Johnson appears to assume that warning on this score is practically equivalent to advising poultry keepers not to hatch before or after March and April.

This department has frequently suggested the possibility of making the raising of early broilers profitable. At the ruling prices offered last season for broilers, at even a lower price, there is the possibility of making poultry keeping for broilers as profitable as poultry keeping for eggs. But poultry keeping for early broilers is just as dependent upon right hatching as poultry keeping for eggs. Just as the poultry keeper for eggs must have eggs to sell when the prices are high so must the poultry keeper for broilers have broilers to sell when the price is high. By the middle of June culls and excess from farm and orchard flocks begin to reach the markets and down

HATCH AND RAISE EVERY CHICK— SAVE FEED.

Right methods will enable you to get good hatches, avoid death in shell, and bowel trouble in little chicks. With present high-priced feeds you can't afford to feed chicks in a "hit and miss" fashion. It's vital that you know how to keep your chicks growing and healthy. Stop wasting time, money and good eggs. Thousands say the suggestions of the widely known poultry expert, Prof. T. E. Quisenberry, Box 84, Leavenworth, Kansas, President of the American Poultry School, have enabled them to hatch and raise more chicks with less work, less loss and at a lower cost than ever before. Mr. Quisenberry sends his bulletin on "Feeding, Brooding and Growing Chicks" without charge to any of our readers who are interested. His suggestions will save you money, eggs, feed and chicks. Write today before all bulletins are gone.—Adv.

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Incubator is covered with galvanized iron, triple walls. Never leaks, never warps, never rusts. Set up ready to run. Brooder is covered with well made Redwood. Direct from this advertisement—no agent, no middle man. Write for free catalog.

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Save the Baby Chicks

Get book "CARE OF BABY CHICKS," a package of GERMOZONE, the best insurance against all diseases. These little birds more than half they hatch now raise better than 90 per cent. To you who have never tried GERMOZONE, we will send postpaid book and package as above. You pay, if satisfied, 75c 60 days' trial. We trust you.

Drugs and seed dealers sell GERMOZONE, the best poultry remedy and preservative. For old young—bowel trouble, colds, runny eyes, scalded food, lumber neck, chicken pox, sour crop, etc. Sick chicks can't wait. Do it now.

DEO. H. LEE CO., Dept. 455, Omaha, Neb.

\$10.95 Buys 140-Egg Champion Belle City Incubator

Get Water, Copper Tank, Double Door, 140 Chick Brooder, with 25 Eggs. **Both only \$10.95.**

Freight Prepaid Post of 140 Eggs. Guaranteed. Special offers provide ways to save extra money. Order by mail or write for book, "Raising Poultry." It's free and tells all. Jim Neibert, Inc.

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Incubators and Brooders used by the big money makers who stay in business year after year. Poultry Lessons Free. How to Raise 40 out of 50 chicks. 10 cents. Catalog Free. Write today.

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62 BREEDS Most Profitable Pure-Bred Chickens, Ducks, Turkeys. Hardy fowls, eggs, and incubators at lowest prices. Write for Poultry Book FREE.

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90 Varieties, All Breeds, Choice Poultry, Eggs, Pigeons, Dogs, Ferrets, Parrots, Caviar, Belgian Hares, etc. **BOOKLET FREE**, or will mail colored descriptive 60-page book. "Our Store at Your Door," for 10 cents. J. A. Burger, Box 37, Telford, Pa.

BABY CHICKS—10 best varieties. Parcel Post Delivery. "How to Raise Them" Free. **STERNESCH, 50 N. 4th St., St. Louis, Mo.**

Also Fresh English Bantam S. C. White Leghorn Chicks. Most popular and persistent layers. Largest breeders and importers. Privately Leghorn Farm Co., Zealand, Neth.

go prices. Hatching for broilers must be early enough to get ahead of this onrush. March to June being the period of high prices for broilers, hatching must commence in time to have broilers for the early market and continue long enough to keep broilers moving to market through the entire period of favored prices.

Mr. Johnson rightly points out that it would be "very mischievous to give the people at large the impression that they should do all their hatching in March and April." One could say with equal discernment that it would be very mischievous to give the people at large the impression that the matter of hatching dates is relatively unimportant, which is unfortunately the prevailing idea.

Late Hatching

Mr. Johnson says the best laying flock was a hatch brought off the middle of June.

This department has never contended that a May or June hatched pullet will not make a good layer. Indeed, this department has no certified data on this subject. Perhaps the experiment stations will finally reach this phase of study and make a test to show what may be expected on this score.

While there is necessarily a close relation between the laying pullet and the paying pullet, it does not follow as day follows night that the best layer is the best payer. The best payer is the pullet that lays the most high priced eggs. The period of high priced eggs being from November to February or March, good management requires the hatching to be

done at a time that will produce a pullet that can meet these requirements. The accurate observance of this fact is the safe and sane thing for those who keep poultry for eggs.

What should be done with late hatched stock? Shall one stop hatching the last of April for the heavier breeds and the last of May for the lighter breeds? This department has repeatedly advised the continuance of hatching but has suggested that such stock be sold to market. The pullets from these late hatchings may be kept and fattened for December and January high prices for soft roasters. There are circumstances, to be sure, which would warrant the keeping of such stock for eggs, but their determination must be carefully considered. Be sure you are right and then go ahead.

Combination Poultry Keeping

Keeping poultry for early broilers, for fall and winter eggs, and late fall and early winter roasters should and could be combined in such a way as to make each line return a good profit. The schedule would be to have on hand the right poultry product at the right time, which from the standpoint of the poultry keeper, is the time of high prices. When the market demands early broilers and begs for them, have early broilers to sell; when the market begs for fresh eggs, have fresh eggs to sell; and when the market asks for soft roasters, have soft roasters to sell.

This combination would call for the eight hatches Mr. Johnson speaks of. Eight or nine hatches would insure the economical use of incubators and brooders.

Home Storage for Apples

By J. M. Myers, Maryland

BUYERS are looking for better apples. The grower can produce them with proper care, but cannot supply his trade the year round unless he has a proper storage. While we can dispose of our apples at picking time at prices ranging from \$1.50 to \$3.00 per barrel, we should not overlook the local trade, which gives us the best profit, by placing a few hundred barrels in a good home storage, the profit of which will more than pay for putting up of storage the first year. Prices as well as the demand for apples are always good in March and April in our home towns. Apples hold up longer after removing from home storage than they will out of cold storage.

I work my storage this way. At picking time I place my choicest varieties in my

and Paragon in June for same price. Have kept the two last named until August in perfect condition, and exhibited Ben Davis at Maryland Horticultural Show, Baltimore, Nov. 16-20, 1915, that were grown in 1914, held more than 13 months and were in perfect condition, though color became pale.

Construction of Storage

I would advise farmers who grow 200 or 300 bushels to build a similar storage, and have apples in April with good flavor and sound. If possible, select hillside sloping to south or southwest, so the north and northwest winds will not strike the entrance to storage. Dimensions inside are 18 feet deep, 12 feet wide, 6 feet high at sides, 9 feet in center of arch, built with 18-inch stone wall. Concrete will not give moisture enough to insure the keeping of the apples. Notice in picture that it is necessary to extend the front wall on each side in order to hold the earth back.

After the walls and arch are completed cover sides and top over arch with a good coat of earth. Before earth is put over arch, put over brick two inches of good cement and sand to make it water-tight. The arch is best to build with hard brick. Give interior sides of wall and arch a coat of one-inch cement plastering. Do not concrete bottom. By having earth bottom we get the required moisture for apples—drops of water are dripping from arch at all times which makes it ideal.

For ventilation, place two six-inch terra cotta tiles in arch, one four feet from front and the other four feet from back. Also one fourteen by fourteen-inch ventilator in door, by cutting into door the required size. Now cover this opening with heavy wire netting, this will give all ventilation needed. For extreme weather—zero and lower—it will be necessary to have a second solid door to shut off the cold through first door. Never close the solid door unless the temperature falls near zero. Never close top ventilators. Removable shelves are placed for the apples. Three are arranged, one on top of the other, on each side the gangway. This gives six shelves, each holding 50 bushels, or 300 bushels on all the shelves. The gangway should be at least three and a half feet wide.



Concrete and Rock Storage House

storage. My apples are advertised as choice apples. I have plenty of buyers from nearby towns and Baltimore, 36 miles away, coming in automobiles, and taking away full loads for which I am well paid. I have a local trade in a nearby town of 5,000 where I run a delivery wagon. My storage apples are all picked in baskets and hauled to storage in the same baskets on wagon with springs, and carefully dumped. There they stay undisturbed until I want them for sale. I never need pick through them for decayed ones. They do not decay when properly sprayed. Unsprayed apples will not hold up under best storage conditions.

This storage (Fig.) is a little more expensive to build than the old-time wood-construction caves in the hills, but is the cheapest in the end—nothing to decay, which means first cost all costs. The extra money I received for apples the first year more than paid for the building. The cost of building was \$100, storage capacity 100 barrels. I have sold Grimes Golden in April for \$2 per bushel, Stamen Winesap

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Just mail coupon below and we will send you a pair of these wonderful National Work Shoes at once—all charges prepaid. We invite you to try them at our risk. Built solid full of wear. Genuine oak leather soles. Selected wearproof leather uppers. The best work shoe value ever offered! That is why we are glad to send them to you as money in advance. Pay only \$3.65 on arrival. The shoes must convince you or you will not owe one cent. Enjoy their leather-lined 6-toe comfort. Feel how Direct From the Shoe Market of the World, soft and easy they are on your feet. Note the splendid, extra quality leather. Then decide whether you want to keep them. If you do not think they are the greatest value you ever saw for less than \$6, send them back at our expense—it costs nothing to try—the risk is ours.

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Choice Virginia Farms located in the counties of Middle Virginia. Ten dollars per acre and up. Annual rainfall fifty inches—eight months between frosts. You would enjoy Virginia's short, mild winters and delightful summers. Detailed description of Corn, Fruit, Grass, and Stock Farms with map of Virginia free.

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My hardy Pennsylvania-grown grafted trees are the best for eastern and northern planting. Handsome catalogue sent free—write today.

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F. S. STAHL, Box 64, QUINCY, ILL.

Winter Injury to Fruit Trees

Prof. J. C. Whitten

I AM AWARE that the question of preventing winter injury to fruit trees is an important one to Minnesota horticulturists. It may be a surprise to some of you to know that preventing injury by cold is also an important problem to horticulturists as far south as my own state, Missouri. One difference between our viewpoints, however, may be that winter injury in this northern section quite usually occurs as a result of extremely low temperatures even when the plants are dormant. This is especially true if your low temperatures come on unusually early before your plants are fully ripened in the fall and especially before the ground has frozen deep. With us injury is likely to occur not so much because of low temperatures while our plants are dormant but because with us the buds often swell and grow on bright, sunny days in winter, rendering them tender and susceptible to injury from subsequent cold spells. Our plants suffer worse then in late winter after they have been made tender by previous warm spells or even by spring frosts after they have come into bloom.

Your experiment station is doing leading work in studying factors that favor or oppose winter-killing under your conditions. While our problem is a different one, at the same time it may not be altogether without profit if we consider the problem as it presents itself to Missouri horticulturists.

The Missouri Problem

A quarter of a century ago when I began horticultural work in Missouri our growers were very much interested in factors favoring or opposing hardiness of the peach and some other semi-tender fruits. They were asking the question: "Will peaches stand Missouri winters any more safely if we purchase the trees from northern nurseries or should we send to southern nurseries or patronize our own home nurseries?" They also wanted to know what could possibly be done to keep peach trees more fully dormant on warm days in winter. They observed that peach buds in Missouri frequently swell and grow a little and become tender on warm winter days and therefore are subject to injury by later cold spells.

These were questions to which no one knew the answers. I might add that we have now tested northern, southern and central grown peach trees on our experiment station grounds at Columbia Missouri. Twenty-two years ago we planted out peach trees of Elberta and other varieties from northern and southern as well as central nurseries. These trees have now practically finished their life history. We have found that trees of the same variety have behaved practically alike here that came from extreme northern, southern or home sources. They leaf out at the same time in the spring. They come into blossom at a similar period. They shed their leaves similarly in autumn. Whenever the buds have been injured by winter, northern, southern and central grown trees have been injured to a similar degree. We have not been able to detect any difference in the behavior of trees secured from nurseries of widely different latitudes.

This was contrary to our expectations. We had rather expected that southern grown trees being accustomed to a long growing season and a short winter would tend to wake up earlier in spring and shed their leaves later in the fall. We had expected that trees from northern sources might tend to stay dormant longer in winter, start later in the spring and shed their leaves earlier in fall. We have grown native forest trees from seeds gathered from widely separated sources. At first the native forest trees from southern seed would tend to start earlier in the spring and shed their leaves later in the fall. They took a longer growing season and a shorter rest period. Some of the southern species killed back to the ground the first winter or two, while the same species from seed grown in Missouri or northward stood the winters perfectly. After ten years they adapted so as to behave alike.

Very Interesting Results

An investigation of the premature waking up of peach buds on warm days in winter and the application of methods with a view to preventing it have yielded us some very interesting results.

Over twenty years ago weekly observations microscopically were made of peach buds every week during the winter with a view to determining at what temperature they would swell and grow. Observations covering several winters showed that the fruit buds of peach trees ordinarily remained entirely dormant until some time in January. From January on it was found that at certain periods the fruit buds would swell and grow a little within. The flower parts within the winter bud elongated slightly. We have found that the Elberta peach, for example, is usually capable of standing fifteen degrees below zero in early winter, while it is fully dormant. After the buds have swollen and grown a little in late winter they may be killed by ten degrees below zero. After they have made considerable winter growth even zero weather may kill them.

It was interesting to note that winter growth of the buds was not correlated directly with winter temperatures. They didn't make the most growth during the warmest week of January or February. Growth on the other hand was most marked during periods of bright winter sunlight, even though the temperatures were moderately low. For example, the warmest week in February was a rainy, cloudy week in which there was no freezing weather, the thermometer reaching nearly fifty degrees above zero during the warmest days. No visible growth was made by the buds during this week. The most growth was made during a week of bright, clear sunlight when the day temperatures were near the freezing point, or thirty-two degrees above zero and when the nights were cold.

Tests with Thermometer

It was found that the purple coloring matter of the twigs had the power of absorbing heat on sunny days. Thermometers inserted in the fruiting twigs of the peach often registered from fifteen to twenty-five degrees warmer than atmospheric temperature. During bright winter sunlight the twigs themselves were often warmed up to the temperature requisite for comfort in the living room of a house when the atmospheric temperature was not much above the freezing point. On sunny winter days then the buds swelled, grew and became tender but were frozen up by the following cold nights as soon as the sun went down.

We tried whitening the twigs of peach trees during winter by spraying them at intervals with lime whitewash. This white covering reflected the sun's rays, keeping the buds at atmospheric temperature. It held them dormant. The buds did not begin to swell and grow until towards spring. They blossomed later than buds which were not whitened.

During a ten year period two more crops of fruit were secured on whitened trees than were produced on untreated trees. It was evident then that anything which tended to keep the buds fully dormant through the winter favored their hardiness. Whitening has not been generally a commercial success for the reason that the whitewash has to be reapplied frequently.

It is possible, however, to maintain a more prolonged rest period on the part of the buds by other methods of treatment. The later the buds go into rest in autumn the later they wake up in the spring. If trees are making a slow, weak growth, or if they are carrying an overload of fruit, they begin shedding their leaves perhaps in August, become dormant in early fall, break their rest period in early January and from then on are liable to be stimulated into growth on sunny days. On the other hand, if peach trees are making a strong, vigorous growth and carry their leaves until late fall they begin their rest period late and wake up late in spring.

Helps for Safe Wintering

Anything which induces trees to hold their leaves and go into rest late favors their safe wintering in our state. This can be accomplished by pruning back the trees severely the previous winter, by thinning the fruit if the trees set an overload, by growing and turning under cowpeas or other leguminous crops and by giving

good cultivation to maintain growth throughout the season.

I do not know that this would apply to Minnesota conditions. It is probably more important that your trees ripen their wood thoroughly in the fall, as with you cold weather comes on early.

Another phase of winter injury with us is sun-scald or sometimes frost cracking on the sunny side of the tree.

During bright winter sunlight the tissues on the sunny side of the tree absorb heat which may raise their temperature twenty-five or thirty degrees above the temperature of the air; at the same time the wood on the shady side of the tree remains at atmospheric temperature or a little lower. As soon as the sun is down this warm side of the tree cools off quickly to atmospheric temperature. If the night is cold these tissues, warmed during the day, may freeze up quickly during the night. This high temperature during the day and freezing up at night causes sun-scald or often frost cracks on the sunny side of the trees.

We have found that this injury may be prevented by keeping the tree trunk white-washed to reflect the heat, or by shading it with a board or a tree wrapper while the tree is young. It emphasized the desirability of low spreading tops. As the trees become well branched their limbs shade the trunks, thus preventing the tissues from being warmed by the sun.

*An address before the Minnesota Horticultural Society.

ANSWERS TO MR. BROMFIELD

Editor of AMERICAN FRUIT GROWER:

In your issue of January, page 20, is an article by O. Bromfield, of North Carolina, asking about raspberries and supports in same. Here is my system. Set post at each end of row, nail crosspiece about six foot long, two and one-half feet above ground, placing one telephone wire on each side, as tight as possible and tied at intervals. This will keep all canes upright and does not allow any canes to grow outside of the wire.

The rows are about five or six feet apart, which gives plenty of room for cultivation. Now as to berries—I recommend the Cuthbert and King as they are very prolific here in Nevada. After all berries are gone I cut all old canes out, and in August I set all new canes back to three or three and one-half feet high. These grow new top which do not whip about with winter winds. Don't cut back the King in the fall but take out all old canes. I have also the Kansas Blackcaps. When new canes are between four and six feet high in August bend over and put tops in the ground. These take root and make new plants in next spring. Cut in half, set in a new place and stake. The new plant will fruit.

C. A. HOWARD, Nevada.
Editor AMERICAN FRUIT GROWER:
If Mr. O. Bromfield, of North Carolina, will plant Royal Purple raspberry, in my judgment, find it a wonderfully productive and profitable berry. On my grounds I have tested practically every variety of raspberry and find that the Royal Purple is far superior to others. The plant is healthy, berries extremely large, a wonderful cropper and sells on sight.

THOS. F. RIGGS, Iowa.

SLUMBER SONG

Far away in the mountain steep
The soft little snowflakes cover deep
The beds where the baby flowers sleep
Under the snow
They slumber and grow,
And only Mother Nature knows
Just what is best for each wild rose.

Safely at home as the star folks peep
Neath the silken coverlet snugly sleep
The flower-faced baby sinks to sleep
In her sweet, white nest
She cuddles at rest.
And only the loving mother knows
Just what is best for the wee wild rose.

NEVER GIVE UP

If you think you are beaten, you are.
If you think you dare not, you don't.
If you like to win, but think you can't,
It is almost certain you won't.
If you think you'll lose, you've lost.
For out of the world we find
Success begins with a fellow's will.
It's all in the state of mind.

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Prof. F. J. HAGERLING, 13 Glass Ave., Belleville, Ill.

Livestock and Dairy



Feeding Skim Milk to Calves

By Prof. C. A. Boutelle

START all calves on the first milk of the dam because of its laxative effect. Feed whole milk three times a day until at least one week old. Feed twelve pounds of milk per day per hundred pounds live weight. This general rule can be followed for all ages and for all kinds of liquid food. When fourteen days of age, begin to substitute skim milk for whole milk, substituting not faster than one pound per day. When the calf is three weeks of age she will begin to use grain. We recommend that she be fed all she will eat of the following mixture:

- 80 lbs. corn meal or hominy.
- 30 lbs. wheat bran.
- 30 lbs. ground oats.
- 30 lbs. oil meal.

A good way to feed the grain is immediately after feeding the milk. This grain should always be fed dry.

The temperature of the whole milk and skim milk should always be 100 F. The milk must be scalded every day. A short definite rule is never to feed a calf out of a utensil from which you would not be willing to drink yourself first.

Skim milk should be pasteurized to guard against tuberculosis, contagious abortion and other diseases. A tablespoonful of soluble blood flour with each feeding will prevent digestive trouble.

Calves will begin to eat hay at three weeks of age and should have all they want. They can be fed silage as soon as they are six months old.

Substitution for Skim Milk

It is possible to grow reasonably good calves on ready mixed commercial calf meals or on home mixed calf meal. Purdue University recommends the following mixture of grains for a home mixed calf meal:

- 500 lbs. soluble blood flour.
- 500 lbs. hominy feed.
- 500 lbs. red dog flour.
- 500 lbs. linseed oil meal.

For the first two weeks the calf should be treated as noted above for skim milk fed calves. To prepare the calf meal gruel from the Purdue Calf Meal, mix the proper amount of the meal with enough cold water to make a smooth paste, then add the necessary amount of hot water not above 145 F. The correct mixture of meal and water is one pound of meal to eight pounds of water. Feed the calf the gruel as you would skim milk. If the calf is not thrifty, feed one pint of whole milk with each feeding of calf meal gruel. Supplement the calf meal gruel with the dry grain mixture and the roughage as given above for skim milk calves.

Calves should always be provided with a pail of fresh water daily and with salt. This is perhaps more important with the calf meal fed calves than with the skim milk calves.

GOOD BUTTER SELLS READILY

The home butter maker who is selling butter should remember that the trade wants a uniform and neat appearing product. The butter should be colored, salted, worked and packed in a systematic, businesslike way.

Among the essential items that should not be overlooked are the following:

1. All the utensils should be washed carefully and after being thoroughly scalded, should be placed in a dustless and flyless atmosphere. More harm than good is done by the old custom of placing the pails, dippers and other utensils in the sun, for not more than once in one thousand times are these utensils placed where dust and flies do not lodge on them.

2. Use good judgment in keeping the milk clean.
3. Skim or separate a cream that will test about 30 per cent fat. If too thin, it will churn with difficulty.

4. Add about one quart of buttermilk to

ten quarts of cream to sour it. Hold the cream at a temperature of about 70 degrees F. until it has a mild acidity.

5. Churn at such a temperature that the churning process will require from 30 to 45 minutes. In small churns the necessary temperatures are usually from 58 to 65 degrees F. The churns should be stopped when the granules are about the size of a kernel of corn.

6. Draw off the buttermilk and then wash with about as much water as there was cream, at a temperature of from 52 degrees to 56 degrees F. Revolve the churn two or three times and drain. Then repeat the washing. The purpose of washing is to carry away the buttermilk on which bacteria live. This improves the keeping properties of the butter.

7. Salt and work the butter. It is much easier to distribute the salt when the butter is rather plastic than when it is cold and hard. Therefore, observe temperature control. Work the butter until experience tells you that mottles will not appear.

8. Pack in a carefully scalded and cooled jar or other container. If the butter is sold, one-pound prints are very acceptable to the trade. These prints should be wrapped in butter parchment.

In recent years new methods have been applied to the making of butter when it is manufactured on a large scale. Many of these methods are practicable only because large quantities of butter are handled. All creamery methods, therefore, are not applicable to the process of making butter in the home.

BREEDING EWES DISTRIBUTED

One thousand breeding ewes are being distributed among the farmers of Rock Island County, Ill., through the co-operation of the county farm bureau and the county agent. These ewes will be placed on 66 farms and will form centers for developing sheep growing in this county. Pure-bred Shropshire bucks are being placed with practically all the new flocks.

FEED YOUR CROPS AS YOU FEED YOUR STOCK

Feed your crops well—and regularly. Spread manure as fast as made, if possible.

In feeding your stock, you don't feed them a lot one day and none the next. If you did, they'd choke down twice as much as they should have the third day, and only a part of the feed would be digested. Then why do as some farmers do—spread twenty to thirty loads per acre hoping to enrich the soil so as to not have to feed the crops again for many years? True enough, the benefits of manure are lasting, but too heavy applications cause corn to "fire," and wheat and oats to run to straw. Light, frequent applications are best.

Then, too, it is best to cover as much of the farm as possible as you go along. Make the manure go farther. Instead of spreading twenty or more loads per acre on one part of the farm and letting the balance go without any, spread about five loads and cover more acreage. You wouldn't feed half your stock today and the other half tomorrow.

Regularity and uniformity—these are the guiding principles in using the one best plant food, manure—the plant food that has recently become so valuable through the greatly increased value of crops. The balance of this book will prove these are the correct principles and show wherein spreaders "just fill the bill." Spreaders save so much time and labor as to permit frequent, regular spreading, and more even spreading too, than can possibly be done by hand.

And therein are the reasons why a spreader pays for itself quicker than most any other farm implement. Own one, this year.

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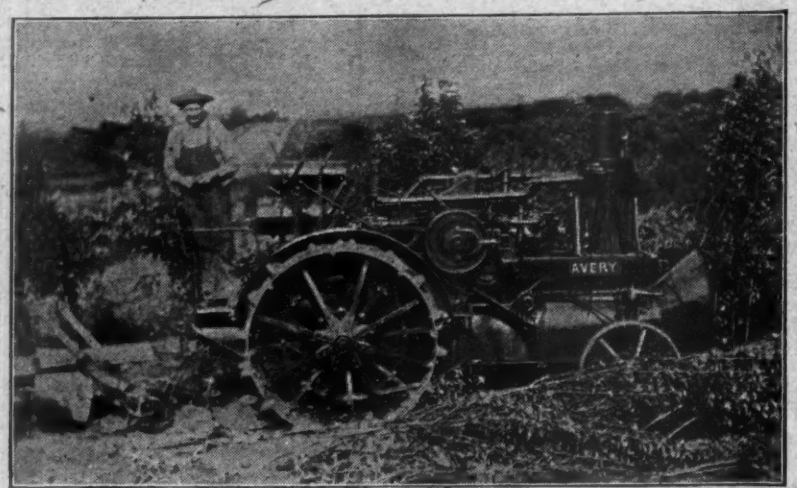
Who Should Own a Truck?

A TRUCK manufacturer was asked why more trucks were not sold to farmers, and he replied that the average farmer did not have enough use for a truck to justify its purchase.

But more and more farmers are buying trucks and those who have them usually testify that they made no mistake, unless possibly they made the mistake that is frequently made by men in other lines of

it soon made its place as a regular member of the working force. It proved such a time saver in the busy seasons that it took on a value not thought of at time of purchase.

In many cases it is made to do duty as a light truck either with or without the use of a trailer, but this is a good deal like using a light carriage team to help with the plowing and is often anything but economical.



Avery 12-25 H. P. Tractor Equipped Especially for Digging Up Nursery Stock. In Operation in Iowa Nursery

business—that of buying an inferior quality or a make-shift.

While we haven't the statistics at hand we all know that a large percentage of farmers today own what was formerly called "pleasure cars," but which are now designated by all manufacturers as "passenger cars." The change of name came about because automobiles have become so useful and so necessary to the majority of owners that it is not considered right to designate them as "pleasure cars."

It might be argued that the farmer did not have time enough to "buggy ride" to justify owning an automobile. And there is no doubt that many farmers bought their automobiles with no other idea in mind than of furnishing a pleasure vehicle to the family.

But once it was established on the farm where it was available whenever wanted

There are not many farmers—especially those who are real human beings and desire to be neighborly—who wouldn't gladly go or "send a hand" with team to help out with plowing, harvesting or any other work after his own had been finished. And for this service the neighbor, of course, is willing to pay and at the same time consider it an accommodation to get the help when he needed it.

And so the farmer who buys a truck soon finds that he has uses for it that he did not think of before he owned it. Likewise he finds that he has neighbors who are glad to pay for having hauling done, and which the owner of the truck has time to do, simply because of the time he has been able to save on his own work.

After all, it is the saving of time that is the strongest argument for a motor truck. This saving of time is often of much greater



The farmer of today is a business man. Manufacturing Companies are making an intensive study of the farmer's needs in the way of machinery and consequently machines and tools from churns to threshing machines are being manufactured that tend to increase the farm, orchard and dairy production even if the farm labor is scarce. The farmers are taking advantage of these implements, in fact the demand is greater than the supply. H. A. Stolte is one of those progressive farmers who early realized and utilized the advantages of farm machinery, particularly motor trucks. Stolte's big ranch is twelve miles from the railroad at Cedaredge, Colorado, with roads full of chuck holes. Thousands of boxes of choice apples are shipped each season from the ranch. Three four-horse teams had been used for years in carrying these boxed apples to the railroad. Last year Mr. Stolte replaced the twelve horses and five men with one 3 1/2-ton Federal and trailer. He makes four of these twenty-five mile trips a day, hauling seven tons on truck and trailer. The saving in time and money is apparent at once and time is an important element in shipping apples and other fruit.

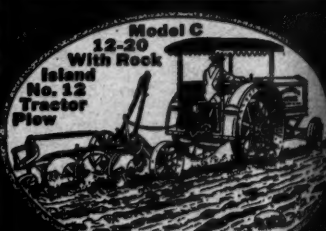
Heider Tractors

Rock Island Tractor Tools



The "Orchard Tractor"—Goes Everywhere

Heider Model D may be called "The Orchard Tractor." Has all points of special design for orchard work; easily goes under trees, into fence corners, everywhere. Heider Patented Friction Drive; 7 speeds forward or reverse with one motor speed, one lever. Shows with Rock Island Power Lift. Flow attached, ideal one-man unit. Hand guides the tractor, foot controls plow. Sold with or without plow. Model C (below) for larger farms. Eleven years' actual field work. Send for tractor catalog.



Rock Island Farm Tools include Plows, Discs, Planters, Seeders, Cultivators, Listers, Hay Rakes, Hay Loaders, Crown Separators, Manure Spreaders, Gasoline Engines, Suck Outlets, etc. Write for our Farm Tool Catalog.

ROCK ISLAND PLOW CO. Established 1885

750 Second Ave. Rock Island, Ia.

Get My Price FIRST

BECAUSE of the high prices generally prevailing you ought to get my price. You can buy direct from our factory at the lowest cost. But that isn't all. The Monmouth Disc is easier on your horses. Makes a better seed bed for large crops, turns around as easy as a plow, cuts weeds and clover and turns trash under.

Monmouth Tongueless

Guaranteed for Five Years. Blades are made of high carbon steel. Adjustable scrapers, hard maple bearings, rollers and transport trucks if you want them. We also make complete line of Tractor Discs. Free trial for 30 days. Return if not satisfied and we will pay freight both ways. Send a postal card for full details on farm tools and supplies. Get our big Free Book and see money-saving prices. Ask the Flow Man with



Quick Shipments from Monmouth, Kansas City, Omaha, Fargo

more than the per day value of man time used.

The ability to quickly market a crop—especially a perishable one such as fruit and vegetables—often means a snug sum. Again it often enables the owner not only to market a crop at the right time, but at that particular time it may be worth a great deal to have the time to plow, plant or harvest some other crop. To have lost the time it would have required to do the marketing in the old way may have proved serious.

"A time for everything" is a proverb appreciated perhaps more fully by the successful farmer or fruit grower than by any other class of men.

The truck eats nothing but interest on the investment when not at work. It will work all day and all night in an emergency without its owner being subject to arrest for cruelty to animals, and it will make just as many miles on a hot day in August as on a cool day.

There are a lot of things in favor of having a motor truck on the farm.

HIGHWAY CONGRESS MEETS

The action taken by the highway congress, in Chicago, which recently adjourned, after recommending the creation of a Federal Highway Commission and urging extensive highway construction, is attracting deep interest in legislative circles at the national capital.

In the first place, much significance is attached to the fact that this was the first congress devoted to highway development ever held in the United States. The enthusiasm shown and results obtained is taken to mean that the people of the country are now ready for a nation-wide road-building campaign.

The fact that the highway congress was composed not only of the industries, but because state highway officials joined in with the other interests, and also a very large representation of Chambers of Commerce and other civic organizations from all parts of the United States, is being commented upon here as adding emphasis to the fact that the time is at hand for real road building.

Fourth Assistant Postmaster General Blakelee, who loses no opportunity to urge a greater use of the highway for parcel post motor routes, is back in Washington, highly elated over the aroused interest in modern road construction. He foresees a rapid extension of that service as fast as permanent roads can be constructed, and from his experience so far in the operation of parcel post routes he is more firmly convinced than ever that the key to reduced living lies in the road. Others in official and legislative circles are also beginning to see, judging from public comment as a result of the deliberation of the first highway congress, that no amount of marketing legislation will equal the paved road as a means of effecting economies to the advantage of the producer and consumer.

To put the matter briefly, the first highway congress, attended as it was by representatives from every state in the Union, is looked upon as the turning point in highway construction, equipment and operation, from a wasteful to a dividend-earning basis.

RABBITS AND MICE

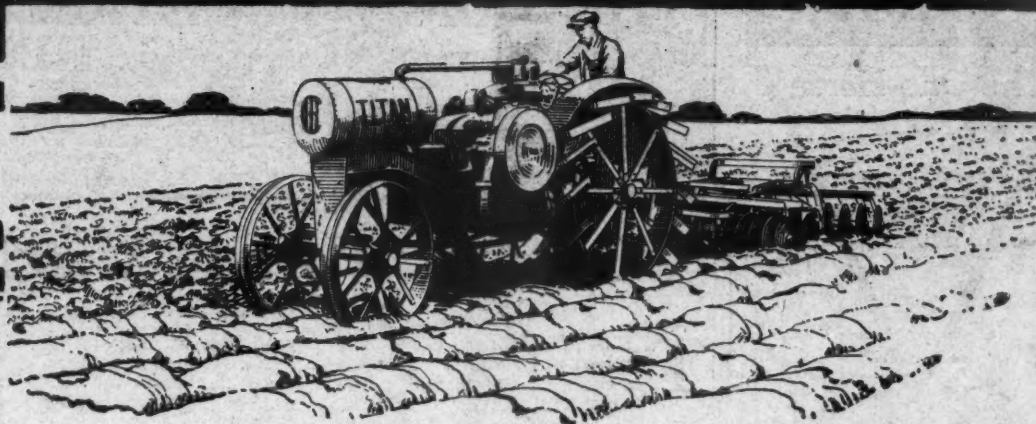
By Edgar Benson, Iowa

We had a short apple crop here last year on account of the weakened vitality of the trees caused by the extreme cold and dry winter. Then, when the trees were in bloom we had one inch of snow, followed by a hot and dry summer.

Apples are not keeping very well on account of ripening too early in the season. We have some good rains and hope for better crops next year.

An excellent remedy to prevent mice gnawing the trunks of the trees is to rake away all trash and then make a little mound of fresh dirt around the trees. A good remedy for rabbits gnawing trees is to take blood when butchering—as the flesh of a rabbit, and rub the trunks of the trees. Rabbits are very sensitive to flesh and blood. If there is much rain in the winter two applications may be necessary. In the northern states, one application is generally enough.

Animal oils for animal materials. There's nothing better than good neatsfoot oil for harness leathers. Mineral oils may have a damaging effect.



The Tractor to Buy

ARE you one of the many farmers who need more power to handle the farm work properly? Do you have to work with less help than you need?

If so, you need an International kerosene tractor. The size that gives you power for your heaviest load will handle all the work. Internationals use only as much fuel as the load requires. They are made to work with farm machines—the kind you are now using—and special hitches are provided for all kinds of field and road work. Their belt pulleys are large enough to prevent slippage, run at correct speed, and are set high enough to keep the belt off the ground. They all use kerosene or other low-grade fuels which means a big saving in operating expense.

come back some day and sell you some other machines in the long list you see in this advertisement. In every sale we try to build for the future.

Tractor Service Whenever Needed

In line with this policy, we have developed a service organization which now consists of 89 branch houses and many thousands of loyal local dealers, wide awake and attentive to the needs of their customers. Service is a very essential part of any tractor sale. When you buy an International kerosene tractor you buy with it the assistance of an organization that brings a well stocked branch house or a live, local dealer within telephone call, fully equipped to keep your tractor working steadily.

The Company to Buy From

You know that we have supplied farmers with high-grade machines for nearly 88 years. You know that our tractors have furnished satisfactory farm power for more than 12 years. We have far too much at stake to market machines of any but the highest standards of quality. We expect to

International Tractor Sizes

International tractors, all using kerosene for fuel, are made in 8-16, 10-20, and 15-30 H. P. sizes. A line to the address below will bring you full information about all our tractors and about any other machines you mention in the list shown in this advertisement.

The Full Line of International Harvester Quality Machines

Grain Harvesting Machines	Haying Machines	Belt Machines—Cont.	Dairy Equipment
Binders Push Binders	Mowers Tedders	Cream Separators	Cream Separators
Headers Rice Binders	Side Delivery Rakes	Feed Grinders	(Hand)
Harvester-Threshers	Loaders (All Types)		Cream Separators
Reapers Shockers	Rakes	Power Machines	(Belted)
Threshers	Combination Side Rakes	Kerosene Engines	Kerosene Engines
Tillage Implements	and Tedders	Gasoline Engines	Gasoline Engines
Disk Harrows Cultivators	Sweep Rakes	Kerosene Tractors	Motor Trucks
Tractor Harrows	Combination Sweep Rakes	Motor Trucks	
Spring-Tooth Harrows	and Stackers	Motor Cultivators	
Peg-Tooth Harrows	Baling Presses		Other Farm Equipment
Orchard Harrows	Bunchers	Corn Machines	Manure Spreaders
Planting & Seeding Machines	Belt Machines	Planters Drills	Straw Spreading Attach.
Corn Planters Corn Drills	Ensilage Cutters	Cultivators	Farm Wagons
Grain Drills	Husk and Shredders	Motor Cultivators	Farm Trucks
Broadcast Seeders	Corn Shellers Threshers	Binders	Stalk Cutters
Alfalfa & Grass Seed Drills	Hay Presses	Ensilage Cutters	Knife Grinders
Fertilizer & Lime Sowers	Stone Burr Mills	Shellers	Tractor Hitches
		Husk and Shredders	Binder Twine

International Harvester Company of America

CHICAGO

(Incorporated)

U S A



RHODES DOUBLE CUT PRUNING SHEAR

Patented

RHODES MFG. CO.

533 S. DIVISION AVE., GRAND RAPIDS, MICH.

THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door. Write for circular and prices.

American Fence

Full gauge wires—full weight—full length rolls. Superior quality galvanizing, proof against hardest weather conditions.

Send for our Special Book on Fencing. Dealers Everywhere

AMERICAN STEEL AND WIRE COMPANY

CHICAGO

NEW YORK

No. 1 Canadian Unbleached Hardwood Ashes Nature's own Fertilizer, contains Potash, Phos. Acid, Lime. GEORGE STEWART, Peterborough, Ontario, Canada

Olds' Marquis Wheat

60 Bushels Per Acre in Illinois

PAUL R. LISHER, Farm Advisor for Will County, Illinois, who bought four car loads of seed of us, writes us September 3, 1918:

"I am very glad to report to you that from the Marquis Spring Wheat purchased from you last spring, some of our farmers have secured yields as high as 60 bushels per acre. Yields of 60 bushels per acre are relatively common and practically all the wheat from this seed has yielded 45 bushels per acre or better."

Olds' 1919 Catalog

tells all about this wonderful wheat, also other seeds—Clover, Alfalfa, Timothy, Oats, Corn, Etc. Samples free. Ask for these wanted. Garden Seeds, Flower Seeds, Bulbs, Tools. Write for Catalog. L. L. OLDS SEED CO. Drawer W-29 Madison, Wis.

Kindly Mention American Fruit Grower when writing to Advertisers

BEEMAN

GARDEN TRACTOR

The One-Horse Tractor

It Replaces the Horse

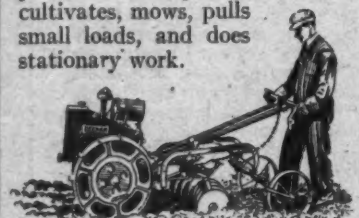
\$285

f. o. b. Factory



It Completely Motorizes Nurseries

and fruit farms—solves the help problem. It plows, harrows, cultivates, mows, pulls small loads, and does stationary work.



Ask your nearest dealer for a demonstration or write us for free booklet.

Beeman Garden Tractor Company
341 Sixth Ave. South, Minneapolis, Minn.

All Your Garden Tools in One



Ideal for small gardens and truck patches. With its several tools—which are quickly interchanged—you can plow, open furrows, cover them, cultivate and hoe. The large wheel and "double curve"—which is an exclusive feature—elevate the draft and make the

Leader Garden Plow

easier to operate than any other hand tool on the market. Readily adjusted for adults or children—just the thing for families where everyone helps in the garden. Your hardware dealer carries them and you will be surprised how reasonable they are in price.

Descriptive folder sent on request.
THE LEADER PLOW COMPANY
Staunton, Va.

Descriptive folder sent on request

GOOD SEEDS

GOOD AS CAN BE GROWN
Prices Below All Others
I will give a lot of new sorts free with every order I fill. Buy and test. Return if not O. K.—money refunded.

Big Catalog FREE

Over 700 illustrations of vegetables and flowers. Send yours and your neighbors' addresses.
R. H. SHUMWAY, Rockford, Ill.

CONDON'S CRYSTAL ONION

The Big Money Making Crop. \$1200.00 from one acre is what our customer Mrs. Dorothy well and to introduce to you our Crystal Onion. Live "Pure Crop" seeds are well and you 250 seed of this most perfect White Onion and our BIG 1919 GARDEN AND FARM GUIDE FREE
CONDON BROS. SEEDSMEN
Box 18 Rockford, Illinois

Seed Peas, Beans, Corn, Potatoes, Swedish Oats, Etc.
Buy direct from grower. Write EARL L. COOK, Hannibal, N. Y.

Kindly Mention American Fruit Grower when writing to Advertiser



Outdoor Work in March

By J. T. Rosa, Jr.

THE SEASON for outdoor work has arrived at last for those fortunate members of our gardening fraternity who live south of Mason and Dixon's line, and if the weather continues to favor us with a mild spring, the gardens will soon be resplendent with freshly manured and spaded soil, and rows of green vegetables. With plans for the season's work carefully thought out, and seed of all kinds actually on hand, or at least ordered, everyone will gladly attack the pleasant task of making a garden grow again. If a suitable garden plot has not yet been located and prepared, do not delay in remedying this at once.

good time to make up hotbeds and sow seed of tomatoes, peppers, eggplant, and celery for transplanting to the garden. Another portion of the bed may be devoted to early radishes, leaf lettuce, Chinese cabbage, and onion sets, with the idea of obtaining an extra early supply of fresh vegetables for a few weeks before they are available from the garden.

A hotbed six by twelve feet in size is large enough for the home garden. Locate it in the warmest and sunniest corner of the garden, on a well drained spot protected from cold winds and also within reach of the watering hose. The hotbed



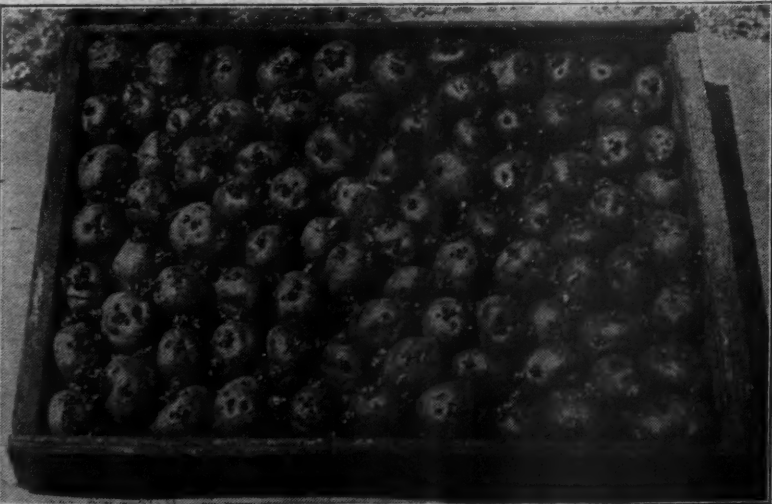
Small Hotbed for Vegetable Plants. Note Straw Used to Cover Bed on Cold Nights

There should be no weed-grown or trash-covered vacant lots and back yards this summer, to reproach our pride as good citizens. Property owners who hesitate to loan or rent vacant lots to would-be gardeners may be considered unpatriotic to say the least. Besides this, a good garden is a better advertisement for sale of a vacant lot than a weed patch. A town filled to capacity with good home gardens gets the name of being a "live" place, to say nothing of the improved appearances and the lowering of the cost of living.

Start Hotbeds Early

Hotbeds should have been already made up in the more southern sections, and seed of the hardier crops sown therein. North of St. Louis, the first week of March is a

consists of a pit, walls and covering. The pit must be the exact size of the proposed bed, six feet wide, 12 to 18 inches deep and 12 feet long. Around the pit is built the frame. Generally the best material is two inch boards though one inch material will do. The frame on the north side should be 15 inches above the ground line and the south wall 8 to 10 inches high. This will give the top a good slope to the south so as to catch the most of the sun's heat. The frame is supported by 2x3 inch stakes driven down preferably on the inside of the frame. Standard hotbed sash 3x6 feet in size, can be bought anywhere, ready for use. For extra protection on very cold nights straw mats, board shutters, or a quantity of loose straw should be on hand.



Irish Potatoes Being Sprouted in a Flat Before Planting

"Victory" Garden Collection

\$2 for \$1

Your "victory" garden will be a success if you plant "Gregory's Honest Seeds." We have a wonderful collection for the home garden—20 high-quality vegetables. They will supply your garden with a complete succession from the first crisp radishes of Spring until the last Squash in mid-winter. These Seeds, purchased separately, would cost you over \$2. Yet, we send the entire Collection—20 full-sized packets—postpaid for only \$1.

Send \$1 today or write for our 1919 Catalog fully describing the "Victory" Garden Collection, also our complete line of Vegetables and Flowers. Do it now before your favorite kinds are exhausted.

J. J. H. Gregory & Son
135 Elm St.
Marblehead, Mass.
In Business 63 Years

MAULE'S SEEDS



LEARN MORE ABOUT SEEDS, CROPS, AND GARDENS

Have bumper crops and beautiful flower gardens all season. Make your garden count strongly in cutting down expenses. Our 1919 seed book tells when, how to plant and cultivate to get the best results.

MAULE'S SEED BOOK

176 Pages of Practical Information FREE

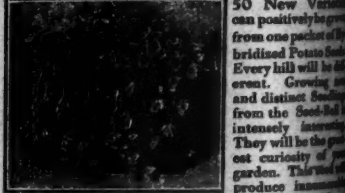
Seed experts, market gardeners, farmers have contributed to this great issue of our Seed Book. Full of helpful hints. Owing to paper scarcity, the edition is limited. Write today for your copy.

WM. HENRY MAULE, INC.
2122 Arch Street Philadelphia

ONCE GROWN—ALWAYS GROWN

HYBRIDIZED POTATOES

From the Seed-Balls—Headquarters Stock



50 New Varieties can positively be grown from one packet of hybridized Potato Seed. Every hill will be a winner. Growing an and distinct Seedling from the Seed-Ball is intensely interesting. They will be the greatest curiosity of your garden. They will produce immense new kinds, colors, shapes, sizes and qualities. Some may be of immense value. Packet, with full directions for growing, 10c. 4 for 50c.; 10 for \$1.00. Our 1919 Seed Catalog Choice Selected Seeds sent FREE with each order. Potato Seed, Send orders at once—Stock limited. SMITH BROS SEED COMPANY, Dept. B, Ashwa, Wis.

SWEET CLOVER

Used like Red Clover. Our seed is treated by scarifying process to assist germination. Prices very low. Send for sample seed, free booklet, 180-page illustrated catalog, and special red ink price list. All sent free. Address

IOWA SEED COMPANY
Dept. B Des Moines, Iowa

FREE BIG CATALOG OF SEEDS

and Plants and Flowers. Send FREE for New Seeds sure to grow at low prices. Gardeners and Wholesale Dealers. ALFRED B. BROS. 18 Elm St. Rockford, Ill.

VICK'S Garden and Floral GUIDE

For 70 years the leading authority on Vegetable, Flower and Farm Seeds, Plants and Bulbs. Better than ever. Send for free copy today. JAMES VICK'S SONS, Rochester, N. Y. 16 Stone Street The Flower

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The Florist

of the excavated soil should be banked
the outside of the frame to make it
The heating material is fresh stable
manure. Cow manure is "cold," and will
do, but fresh straw horse manure will
give the moderate, steady and prolonged
heat desired. When the pit and frame are
filled, pitch the manure in and pack it
down well by tramping. It should be at
least 12 inches thick after packing. Over
this place for inches of fine rich garden soil,
in which to sow the seed or set the plants
of early vegetables. Later, plants from
the hotbed may be transplanted to a cold-
frame to stand 3x3 inches apart. This
gives larger and stockier plants with good
root systems which will make vigorous
growth in the garden.
The wooden sash frames and walls of hot-
beds and cold frames are, from the nature of
their use, exposed to rapid decay. To pre-
vent germs of decay from creeping into the
wood and to lengthen its life as much as pos-
sible, all woodwork should be well painted
or treated. The best preservative treat-
ment for wood work exposed to the weather
in which the appearance is immaterial, is to
impregnate the wood itself with an oil,
which prevents decay. Crude petroleum
oil is used for preserving sash frames and
hotbeds. If the common wood preserva-
tive, creosote, were used, the fumes would
be given off from the wood work in such
quantity as to injure growing plants in the
close atmosphere of the hotbed, while the
crude oil is harmless in this respect. For
treating large numbers of sash frames a
shallow wooden pan about four by seven
feet in size is used, the new unpainted and
seasoned frames being immersed in it in
the hot oil for a minute or two. For treat-
ing a few frames and the woodwork of the
hotbed, apply the hot oil liberally to the
wood with a brush. The oil is very pen-
etrating, especially if applied hot, and the
wood should also be thoroughly dry. After
several days in an airy place the frames are
dry enough to handle and glaze for use on
the beds. By this cheap treatment the
life of the frames will be lengthened a num-
ber of years. If desired, a coat of paint
may be applied to the oiled woodwork,
after the oil has penetrated well, but this is
unnecessary except for the sake of appear-
ance.
Sprout Potato Seed
Even gardeners having only a limited
space should grow a small quantity of
early potatoes for home use. However,
every means should be taken to secure the
greatest possible yield from a small area.
For instance, to speed up the potato crop
the practice of sprouting the seed tubers
before planting may be resorted to. This
results in quick growth after planting in
the ground, producing an extra early crop
and also a higher yield than is obtained
when ordinary dormant seed are planted.
The process of sprouting a small quantity
of seed tubers for garden planting is easy.
Simply secure your seed for planting two
or three weeks before the date intended
for outdoor planting, selecting only sound
healthy tubers, which may be of any size.
These tubers should be spread out in a
single layer on the floor of a light room.
Often a flat or shallow box can be placed
on a living room window where a peck or
two of seed can be sprouted nicely. Under
the influence of the warmth and light the
tubers start to grow, turning a dull green,
and sending out stubby sprouts from the
eyes. If the place is too warm or poorly
lighted, these sprouts become long and
slender. As such sprouts are liable to be
broken off in planting, they are not as de-
sirable as the short stubby sprouts which
are not easily broken off. The seed should
be planted when the sprouts are about
one-half inch long, cutting the tubers in
the usual way, with at least one good
sprout on each piece. These should be
planted by hand with the sprout pointed
upward. Plants from sprouted seed reach
the surface ten days earlier than from
dormant seed and grow off rapidly. A
better stand is generally secured from
sprouted seed, and more tubers are formed
on each plant. The cost of sprouting a
large quantity of seed would prevent this
method from paying on a large scale. The
leading early varieties are the Early Ohio,
and the Irish Cobbler, the latter being pre-
ferred because of its productiveness and
disease resistance. These varieties respond
well to sprouting before planting. As a
general thing, gardeners south of Chicago
would do well to plant only these early
varieties, as late varieties such as Rural
New Yorker are unsatisfactory in the more
northern and western parts of the Corn

Belt, because of the hot dry summer.
The importance of planting potatoes
early should be emphasized. Experiments
have proved that the early plantings not
only give a better stand, but yield consid-
erably more. Planting potatoes late in the
spring nearly always results in disappoint-
ment, especially on poorly prepared soils.
This is because the unfavorable hot dry
weather, and injuries from insects, come
at a time when the plant is just starting
tuber formation. The result is a very poor
crop.
The use of small tubers for seed purposes
is often debated. Unless they happen to
be the crop from a field where diseases are
present, there is no reason why small
tubers should not be suitable for seed pur-
poses. It is not safe to plant seed weighing
less than one ounce, and tubers less than
2½ ounces in weight, had better be planted
whole. The germination of whole seed is
likely to be slow, unless they are sprouted
before planting as described above.
Fertilize the Garden
To get the most out of the garden it is
necessary to have the soil full of available
plant food, and it is equally important to
have it in the very best of physical condi-
tion. There ought to be a regular program
to follow year after year to obtain these
results. For the farm garden, where there
is an abundance of space, a third or a quar-
ter of the garden should be sowed down to
clover each year and the whole growth
turned under late in the fall. Rotten
clover sod is splendid for growing vege-
tables, especially for root crops. A plan
that works well for small gardens is to
plant cow peas on that part of the garden
where the early vegetables are grown,
after these crops have been removed. Or
the peas may be sown between the rows of
vegetables two or three weeks before they
are harvested. The addition of commerical
fertilizer may help too. For many gardens
stable manure is depended upon and im-
proves wonderfully the fertility and texture
of the soil. Heavy applications should be
made in the fall, but light applications
may be made safely in the spring. A layer
two inches thick over the whole garden
is not too much on run down or naturally
poor soils. It ought to be plowed in or
spaded in as early as possible so as to be-
come well rotted and well incorporated in
the soil. Other manures are useful in the
garden, especially sheep and poultry
manures, which are more concentrated,
and are best applied as a light dressing
after a crop has been planted. Composted
leaves and other refuse should also be used
on the garden when available.
A great many gardeners go no further in
fertilizing the garden than the application
of manure, and sometimes this is all that is
necessary. But in many cases other fer-
tilizers are needed in order to get the best
results from the manure or green manuring
crop. Lime is especially good after plow-
ing in a green manuring crop, applying
either ground limestone or slacked lime
broadcast at the rate of fifteen pounds
per square rod. Then all the wood ashes
which can be saved about the place should
be used in the garden, 3 pounds per hun-
dred feet of row being a good amount to
use. Coal ashes have little value as a fer-
tilizer, but they should be sifted to remove
clinkers, etc. Their chief value is to im-
prove the physical condition of heavy soils.
Many complaints come from gardeners
who find that they cannot grow good root
crops and that other crops run to excessive
bush and vine growth instead of fruit pro-
duction. In nearly every case this condi-
tion comes from continuous use of stable
manure and perhaps other nitrogenous
fertilizers, without other kinds of plant
food to make a balanced ration for plant
growth. This condition favors leaf and
vine growth so that such crops as cabbage,
celery, lettuce, chard, etc., will grow well
on this rich soil. Other crops should be
fertilized with bone meal or acid phosphate
to balance off the excessive amount of
nitrogen in the soil. Either of these fer-
tilizers might be used very well in the
garden regularly, as most soils are im-
proved by these fertilizers. Five pounds
per square rod broadcast before planting,
or 7 pounds per hundred feet of row, ap-
plied in the drill at planting time is a good
heavy application. These fertilizers as
well as others can be conveniently applied
by sprinkling lightly around the plants
after some growth has been made. Such
top dressings should be worked in with
shallow cultivations. The gardener who
uses a green manuring crop or stable
manure freely, seldom has need for nitro-

gen fertilizers, but sometimes these are
useful to force quick growth in salad crops,
or to give a good start to other crops that
have become stunted by cold weather,
pests, or other unfavorable conditions. A
soluble form, as nitrate of soda, or sul-
phate of ammonia, should be used, but
these materials will injure plants if used
heavily or if the salt strikes moist leaves.
A convenient way to apply these materials
when they seem to be needed is to make a
solution of one pound to twenty-five
gallons of water. This can be applied by
hand, by a pump or through an irrigation
system. Plants respond very quickly to
this treatment, and watering with this
solution is beneficial for houseplants also.
PROTECTION FROM RABBITS
By H. A. Surface, Pennsylvania
Now is the time of year to be active in
protecting trees from rabbits. There is
not much danger excepting when the snow
is on the ground, but after the snow has
been on the ground for some days the
rabbits may become suddenly hungry
enough for a general attack and do con-
siderable damage at once.
The injury extends to the trunks and
lower branches and may have the serious
result of making a place for fatal blight
germs to enter. Young trees may be cut
off as clean as though done with a sharp
knife. A certain fruit grower insisted that
a vandal had been through his orchard
cutting off the little trees, and took the
writer into the orchard to show what he
considered proof of a malicious attack by a
human being. Examination showed the
stubs cut smoothly, but the remainders of
the tips were found on the ground so eaten
that they would not fit the stubs, as they
would have done if cut by a knife.
As rabbits stand on the snow to feed,
it is easy for them to reach above ordinary
wrappings or mechanical devices when the
snow is deep, but such devices as give
mechanical protection are all right when
the snow is not deep. Woven wire wrap-
pings are effective for shallow snows, but
not for deep, if you purchase the short ones.
Rags dipped in lime-sulphur solution and
wrapped around the trunks are effective,
safe, and economical. Succulent branches
placed around a tree trunk will give it pro-
tection as long as they last and are avail-
able.
Fundamentally, of course, the rabbits
should not be in the orchard. Burning
brush piles, removing piles of wood and
rails where they live, making it impossible
to get under buildings, as by closing holes,
filling holes in the ground which they would
inhabit, etc., all are good means of pro-
tection.
A pair of beagles or Airdale dogs in the
orchard, will soon learn their duty and
be on the job almost constantly in a very
effective manner.
GROWING WATERMELONS
By Sterling Rouse, Kentucky
In the following I am going to give you
my way of growing the family supply of
watermelons, which are both relished and
healthful fruit for almost everybody.
Take any good garden soil, plow in fall.
In February or first part of March I haul
fresh manure and make piles about six
inches deep, and four to six inches in di-
ameter, where the hills are to be made, and
let the manure lie till the ground is to be
prepared to plant. Then scatter what
coarse manure has not melted. I then
take about one half bushel of fine sand,
if I can get it, and mix one pint of high
grade truck fertilizer with sand, dig a hole
where hill is to be, put the sand in and
plant the seed. If sand can't be obtained,
mix fertilizer with soil and plant.
It is not necessary for ground to be
plowed in the fall but it is best. Last
year I raised 75 or 80 melons on 14 hills,
planted as described. Almost half of the
melons weighed over 20 pounds. The
variety that has done best for me is the
Tom Watson. This is for northern Ken-
tucky. Farther north early varieties are
preferred. This is a good crop for the
young orchard, can be planted between
trees, and will be enjoyed by all. For bugs
I use bordeaux and arsenate. At the
market price paid for melons here last
summer, these 14 hills yielded over \$25.00
worth.
Clean surroundings in the dairy barn
and clean methods of milking mean more in
clean milk production than does an ex-
pensive equipment. Better have care in a
whitewashed wooden shed than careles-
ness in a white-tiled cow palace.

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Home Orchard Club Project

By C. J. Burkholder, Indiana

THE WORK that a person is most interested in is the work that he is primarily responsible for. The man who makes only one part of a machine does not take the interest or feel the responsibility that he would if he were making the entire machine. The home orchard seldom has anyone who takes the responsibility for its success or failure. Whenever there is nothing else to do, and there is a little straw or manure in the



"SPRAYING DAY." The Boys Help Each Other in This Work

way, the orchard may get it, usually more by luck than anything else. No one takes the orchard as his special farm problem and looks after it, and plans for it, the way other areas on the farm are treated.

Mr. Kellar E. Beeson, club leader at Columbia City, Ind., says: "A great many of our farms have a boy who would be enthusiastic over making the home orchard his special farm problem with only a little encouragement and help." In the spring of 1918 Mr. Beeson organized a Boys' Orchard Club which had five boys as members who had home orchards. A horticultural specialist from the Purdue Extension Department gave a pruning demonstration and pruned a representative tree in each orchard. The boys pruned the remaining nine trees with this tree as a check. In most cases each tree received about a half load of barnyard manure which was mostly scattered underneath the droop of the branches rather than close up to the body of the tree. Any old stack bottom, straw or partly rotten cornstalks about the farms were used as mulch and spread under the trees as far out as the limbs extended and deep enough to keep down all growth of grass and weeds. This material adds humus to the soil and acts in the same manner as cultivation in preventing evaporation of moisture during the summer. Another advantage of mulched over cultivation in the home orchard, is the fact that the hauling of straw about the trees can be done in the winter or slack season of the year, while the cultivation comes during the rush of spring farm work. The boys found

it is absolutely necessary to get the spray on every inch of the tree's surface. Where the trees were large and badly infested with scale, the boys sprayed first with say a west wind, then made another application when the wind had changed into the east, northeast or southeast, thus insuring against missing a strip of each limb to windward.

The first summer spray of lime-sulphur solution (1½ gallons to 50 of water, plus 1½ pounds of powdered arsenate of lead) was put on just as the buds were showing pink. The same spray was applied just after the petals fell, again three weeks later, and the last time the second week in July for late broods of codling moth.

The boys did all the work. The club leader taught the boys how to mix the spray and emphasized the importance of thoroughly covering the whole tree with the spray, by personal demonstration. The barrel pump with 35 feet of spray hose, a 10-foot bamboo spray rod and angle nozzle makes a very satisfactory equipment for the 20 tree farm orchard.

The fruit which the boys produced on these old trees which had been neglected for years was almost entirely free from fungous and insect trouble. The unsprayed trees in the orchards produced practically nothing at all and the few specimens remaining on the trees in the fall were scarcely fit for cider stock.

Net from \$35.83 to \$72.94

One boy picked 16 bushels of fruit from one Duchess tree which netted him \$20.



Spraying the Tree That Brought a Net Return of \$20

The actual cash outlay in caring for the entire ten trees was \$9.31. The boys were allowed 25 cents an hour for the time they spent in the orchard, and taking out, in addition, cost of pruning tools and spray materials the lowest 10-tree plot still netted \$35.83 and the highest \$72.94 with an average net per tree of \$5.49.

The farm orchard lends itself very readily to this type of club work. Care must be taken, however, to select trees for such a project which are still vigorous. One of the first things necessary in the rejuvenation of an old apple tree is to give it plenty of barnyard manure. A load to the tree is not too much. In pruning reduce the number of small branches over the outside of the tree rather than to cut out all the limbs in the center of the tree or get all the work done in a few minutes by cutting out a couple of large limbs.

Probably the one most important operation in the farm orchard is spraying. All the work done in the orchard is practically a total loss if the trees are not sprayed. An outfit suitable for the home orchard of twenty to twenty-five trees will not cost more than \$20 to \$30. The state universities, experiment stations, and county agents are always prepared to help those, sufficiently interested, to solve their orchard problems. High school agricultural teachers and club leaders are in a position to do a great deal in the way of educating and encouraging the farm boy to take an interest in the farm orchard, thereby insuring an adequate supply of fruit for the farm home.

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Neglected Orchard Pays Profit

By Earle W. Gage, New York

C F. MASON, of Hickman Mills, Mo., has made a fortune from a 40-acre apple orchard that the neighbors swore could not be made to pay. Up until the time Mr. Mason took hold of its management, this 40 acres had never been known to pay more than \$200 per year. His profits the first season totalled \$2,000; the next year \$2,500; the third season, \$8,100, and in the eight seasons he has rented this tract, he has banked more than \$40,000, in spite of the fact that he had gone up against two pretty disappointing seasons.

It was in 1910 that Mr. Mason quit the trail of the grip to rent this 40-acre orchard. When he went to the owners and asked if he could rent it, they were delighted, for they thought they had discovered a new brand of fool, who was willing to part with his time and money. Mr. Mason made his own terms the first year, since then he has made so much profit with the orchard that the owners have been very pleasant in their terms, since he had converted a millstone into a bank.

The second day after the contract was signed the renter with a force of men went into the orchard, consisting of 15-year-old trees, and the battle for a crop started. The trees were then in bloom and the work

lime to ten parts water. This application is very good."

Cultivation and Pruning

Mr. Mason banks for apple profits on cultivation, since he has demonstrated that his section of the country demands this treatment. "Cultivation of an orchard is just as necessary as cultivating corn," he says, "and other crops. Moisture must be present in the ground and the weeds must be kept down to prevent drinking up the moisture and the fertility the trees need. The surface must be thoroughly tilled, too, to permit the moisture to enter the ground. Fall plowing of orchards has many great advantages.

"Another very important thing is the pruning. Remove the surplus wood and clear the tree out so the sunlight and air strike it. Never cut out so much the sun will strike the big limbs. Don't do all the pruning at once. Pruning should extend over a period of years. All cross limbs and all that are in the tree's way should be removed, not all that is in your way.

"Pruning is an art. I advise all orchardists who want to engage in the business, as a business, to take a course in horticulture, either in some recognized agricultural school, or take a broad course of study at home. Watch the trees and their needs—study them closely. Each tree might require different treatment. In one tree we pruned properly in our orchard, the size of the apples was doubled over former years. The value of the apples was increased, as was the color and flavor."

Mr. Mason starts spraying young orchards early, especially the first year. He says to do so prevents fungus from getting a start. He sprays the young trees in the winter, also. "It is not advisable to set young trees out in an old orchard," continued Mr. Mason. "We tried it and failed. The trees either died or just simply refused to live. I put new trees on fresh soil that has been rotated in various crops for at least five years."

SIMPLIFIED ? SPELLING

Many a time and oft, indeed frequently, since the picturesque days of Bret Harte and the "Spelling Bee at Angels," we have yearned for a more direct road by which to arrive at phthisis and pneumonia. We would like to see a quick change in this matter as the present status leaves us wearily nervous lest we should be caught napping.

Sec. Robert W. Mason, requests us to try out the following in several articles of our next issue. We are vested to find the proofreader recalcitrant. He prefers to stick to his antique methods. Proofreaders can be ecswisitly annoying, and we are, therefore, forced to confine our efforts to Mr. Mason's own article which follows:

30 Temple St., Boston, Mass.

My Dear Sir—Will you kindly "try out" this suggestion in an article or two in your next issue and forward us a marked copy of the same. We are sending this out as a test. If it takes well (and we believe that it will) we have something further to add:

Use cw for qu (ewick, frecwent). This was Old English usage before the Norman Invasion (1066); was Classical Greek usage; and is Spanish usage of today—Occurs once to about 400 words. Use cs for x (mics, necst). This was Old Latin usage of the days of Cicero, and with us the x-sound is served often by cs, cks, ks, etc. (politics, stacks, books, acts) than by x itself—Occurs once to about 400 words—See Dictionary on q and x.

Now, the point is this, q and x are worthless letters—"ecswisit" (exquisite); they have no vital associations clinging to them; they are barbarisms forced into English through invasion and it is rather a disgrace for an intelligent people, now in the forefront of world affairs to be so backward and barbarous in its orthography. "Let's do a little house cleaning." If you will just try this out and give us a chance we will show you something good to come out of it.

Yours in good hopes,
ROBERT W. MASON, Sec'y.
P. S.—Just O. K. this idea and turn the matter over to the proofreader who will make the changes in the proofreading—cw for qu (ewick, frecwent); c, only, for que-final (picturesc)—e-insert in anteic). Cs for x (mics, necst); s, only, for x-in-plural (bureaus); z for x-initial.



A seven-year-old Wealthy apple tree, loaded with fruit, in the orchard of Wm. A. Vandevere, Port Ewen, N. Y. September 21, 1918.

had to be done in quick order. It was. The first year the profit of \$2,000 permitted the back-to-the-lander to purchase equipment needed to handle the orchard along practical lines.

The topnotch production was reached in 1912, when more than 15,000 bushels were harvested, selling for \$8,100. More apples were sold from the orchard in 1918, but the result was not so important, since the trees are now in fine condition. In 1914, due to drought, the crop was reduced to about 9,500 bushels, which sold for \$6,000.

Record of Sprays

Mr. Mason says that 10 per cent of the orchards in Missouri and Kansas produce 90 per cent of the apples of a marketable type. His aim from the start was to have as near a 100 per cent producing orchard as possible. "I sprayed first in the spring at cluster bud time," he says, "applied when the first leaves are about as large as a mouse's ear. That was primarily for scab. I used one gallon of lime-sulphur solution to 25 gallons of water.

"I sprayed the second time just as the blossoms were dropping. That was for the codling moth. I used one gallon of lime-sulphur to 40 gallons of water, with two pounds of paste arsenate of lead, or one pound of dry arsenate. The third spraying was the same as the second, and was applied two weeks later to control the curculio. The fourth spraying was done the first week of July, using the same formula as in the second and third applications, to control the second brood of codling moths and side worms. If cankerworms are prevalent I use three pounds of paste arsenate of lead, or half in dry form, to 50 gallons of water.

"That is the spring spraying. If San Jose scale is present that must be treated in winter, after the leaves drop and before they make their appearance in the spring, spraying once with a strong solution of lime-sulphur in proportion of one part of



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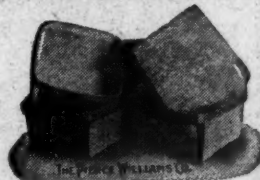
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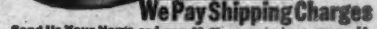
5.—I find nothing that should be omitted. In fact I would repeat articles in either the old or a new form, every season. Mr. Green's article on keeping apples will not do a new subscriber any good next fall when he picks his apples. You know about it, but he doesn't. Each September there should be an article to teach the new and remind the old sub-

The twelfth Annual Session of the Australian Conference of Fruit Growers was held at Launceston, Tasmania, on October 5th. According to the "Fruit World" of Australia, "There was a marked unanimity in the discussions: differences between the states which had previously been vigorously debated and keenly fought, seemed by mutual consent to find their place in the larger vision of a commonwealth and New Zealand-wide brotherhood. The pervading spirit was that the industry of fruit growing was bigger than the confines of any one state or New Zealand: that the interests of one were the interests of all. In fact, this could not fail to be the spirit when in the conference chamber were sitting men from tropical Queensland alongside of men from Southern Tasmania and New Zealand."

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Photo by Ohio Experiment Station

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Fertilizing the Orchard

Discarding the Old Theories in Preparation for Newly Established Facts

By S. B. Haskell, Maryland

THE FEEDING of orchard trees is a more difficult proposition than the fertilizing of most other farm crops. We are dealing with a permanent crop—one that oftentimes occupies the land for more than the space of a man's lifetime. We are also dealing with a deep-rooted crop, and one for which the condition of the soil is of the utmost importance. The crop, also, usually has a very high acre value, which in itself has a very material, but seldom appreciated bearing on the whole fertility problem. Perhaps because the problem is in its nature so very complex, there has arisen a number of—well, let us call them fads and foibles, all having to do with the fertility treatment of the orchard.

For the sake of clearing the ground for consideration of certain newly established facts regarding the feeding of orchard trees, some of which have been brought out only within the last few years, it is worth while to take a little time to discuss some of those old theories to find how they were

It so happens that some fifteen years ago, the writer was for a time in immediate charge of one of the oldest orchard fertility experiments in the United States. He had, at that time, recently graduated from an agricultural college, and naturally was somewhat prone to apply the teachings received to results secured in this special orchard. The orchard was just coming into full bearing, the differences due to treatment were marked, and the opportunity to substantiate theory rather than to make new observations was rather marked.

Barnyard Manure and Increased Wood Growth

The first plot in this orchard was treated with barnyard manure. It had beautiful wood growth, in fact better than that secured from any other fertility treatment. It also gave much the largest yield. The apples were large—regular pumpkins, in fact. Quality, however, was very, very poor—so poor that the apples from this



Where Phosphoric Acid and Potash, but no Nitrogen, Were Used
Three-Year-Old Peach Orchard Experiments in West Virginia

developed, and why it is that some of them are still being followed. I will list a few of these once popular "theories:"

- (1) Fruit trees need no fertilizer.
- (2) Fruits are mainly water, contain but little plant food, and hence need no artificial feeding.
- (3) Nitrogen should not be used on trees—it stimulates wood growth at the expense of fruit production.
- (4) Potash gives color to fruit, adds flavor, and makes the tree resistant to disease and insect injury.

Any orchardist who has been at the production end of the game any length of time can add to this list—perhaps even a few pet theories of his own.

There must be some solid foundation for all of the above theories. Fruit growers as a class are careful workers—and also accurate observers. They may have made mistakes, as for instance to draw an illustration from another phase of orchard practice, when they took it for granted that to prune was to increase growth, and to reduce the leaf area of the tree was to increase its yielding capacity. Yet, in general, the practices arrived at by fruit growers are based on sound practical reason. Despite this, all of the above theories can be shot full of holes.

Many practical men have wrongly interpreted what they have seen in the orchard—and hence arrived at unsound deductions, and practices not based on solid foundation.

The writer of this article must admit that he himself belongs to the above class—and for the time being he is going to make himself the "goat," and relate his own experience in misinterpreting the results of fertility work on orchard trees.

plot were discriminated against by those who knew about them.

Now manure is effective very largely because of its high nitrogen content; furthermore, as we will try to bring out later, nitrogen is the plant food element most effective in increasing wood and fruit growth. Comparing these two results—very large wood growth, and poor quality growth—what could be more natural than for the writer, being somewhat younger than he is at present, to conclude that nitrogen definitely injured quality of fruit produced, and that in general it should not be used on orchard trees? Actually, he even went a bit farther, and claimed that barnyard manure was not a satisfactory fertilizer for apple orchards.

From the light of later investigation the writer is perfectly ready to admit that when it can be obtained, barnyard manure is often an excellent thing to apply to orchards. But, to come back to the question—just what was the cause of the poor quality of the apples grown on the manure plots? Was it due to nitrogen? or, to too much nitrogen? or, to too little pruning? Or to the sum-total of unbalanced fertilizers and pruning not of the best? There are many possible causes for the results—the deduction regarding nitrogen and its injury from its use were definitely unsound.

Do Wood Ashes Give High Color to Fruit?

The next plot was treated with wood ashes, one ton per acre annually. Perhaps it should be said in passing that the orchard was in sod, so that it showed the effect of barnyard manure, or of other treatment on the sod, as well as on the trees themselves. The apples on this

we always highly colored, sometimes meaningly the best in the whole orchard. On the other hand, the fruit was usually somewhat inferior in size—although not markedly so, and the yield was disappointingly low compared to other fertilized plots. The wood growth on this plot was also very small especially when compared to the adjacent manure-treated plot.

What was the cause of the high color of the apples grown on the wood ash plot?

At the time the writer concluded that it was potash—in fact, he thought he had proved it. Possibly, however, there are many readers of the AMERICAN FRUIT GROWER who will point out that the facts of poor wood growth, and the trees therefore being open to the sunlight all the year around, were responsible for the high color of the apples grown on wood ashes. Should they do so, the writer would hesitate to take up the cudgels in favor of the old theory.

The third plot had no fertilizer. Furthermore, it so happened that about this time the whole orchard was badly infested by the San Jose scale—at that time a new addition to the list of orchard pests.

but immensely better than that on the unfertilized plot, which was almost exactly 80 barrels. The yield on the manured acre was 556 barrels, somewhat better as will be noted than that on the best of the fertilized plots. It was certainly well worth while to demonstrate this fact, for today too many orchardists are living on hope and a memory of the time when soil conditions were better than they are at present.

Now, to sum up positively just what was demonstrated by these experiments?

In the first place, they showed very definitely that one of the theories which we have mentioned—that which inclined to the view of apple trees needing no feeding, was unsound. Apple trees do need feeding, and when the soil can't furnish it all, food must be supplied from outside sources.

Secondly, these experiments showed, under certain conditions that artificial fertility treatment may be very profitable.

Thirdly, and perhaps more important they illustrate the difficulty of drawing sound conclusions from limited data.

So much for the old theories. Parts of all of them are contained in the theories on which our present-day practices are based.



Where all three plantfood elements—Nitrogen, Phosphoric Acid and Potash were used. A complete fertilizer is best. Three-year-old peach orchard experiments in West Virginia

Methods of control had not been worked out. The fertilized plot was very severely injured, more so seemingly than any other plot. On both sides of this fertilized plot the fertilizer application carried potash, wood ashes on one side, and muriate of potash on the other. Therefore, the writer came to the conclusion that the use of potash in fertilizer rather markedly reduced the ravages of the scale. Looking back on this conclusion it seems more or less laughable, but in fact is not more laughable than a number of other conclusions which are reached now and again. It is simply embarrassing to have to admit the error—that is all. The fact that on other fertilized plots the treatment was such as to lead to fair wood growth, and in three of the five plots, to good wood growth, was absolutely overlooked. Yet it is probable that this more vigorous growth of wood was responsible for the trees on these fertilized plots partially out-growing the attacks of the scale insect, and avoiding injury until such time as methods of control caught up with the spread of the pest.

Bone and Potash Brought in Clovers

The last two plots had complete fertilizer, made up of bone and potash salts. This treatment was quite markedly effective in bringing in clovers, which doubtless supplemented the comparatively small amount of nitrogen contained in the mixture itself. Results on both of these plots were very good. They have in many cases served as a basis for fertility practice in orchards of the neighborhood.

The one big thing which this orchard established was that it paid to feed the trees, and feed them liberally. At that time the orchard was approximately twenty years old, and the yield from the best of the fertilized acres totaled 488 barrels—not by any means a large yield,

The rest must be thrown into the discard, for the results of work done in several of our agricultural experiment stations now gives us an opportunity to formulate a statement of principles on which a system of rational fertility treatment of the orchard may be based. To do this, however, we must base our case on feeding the plant and not on feeding the soil. The plant itself is the same wherever grown. Soils differ. After all, the big problem is to understand the plant—and to supplement the plant food furnished by the soil on which it happens to be grown, by those foods which the plant itself shows that it needs. On this basis our principles may be formulated as follows:

(1) Practically all fruits are borne on new wood. This holds for apples, and also holds for peaches. The principle applies in the grape vineyard as well as in the apple orchard. Even when we come down to the cane fruits we find that it holds true, for the suckers produced by this year's growth furnish the new bearing wood for next year's crop. Likewise, the strawberry, the smallest of the fruit plants, bears its fruit on the new wood, for here the runner from this year's mother-plant furnishes the new wood for the bearing of next year's crop.

(2) As a corollary, the best fertility practice is that which first produces and then controls new wood growth. There is no object in growing it and having it winter-kill—growth such as this is produced but not controlled. Also, there is no object in having so much wood that the fruit is of poor quality. Production and control must go together.

(3) Associated with the foregoing must be those fertility practices which keep the soil in condition, which keep it alive, which give it ability to hold water, and to admit free circulation of air.

In the April issue will be taken up the producing and controlling bearing wood.

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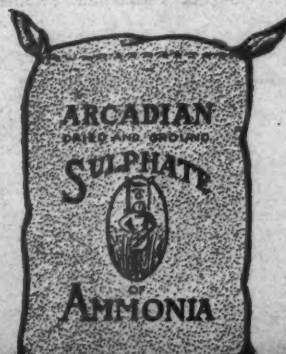
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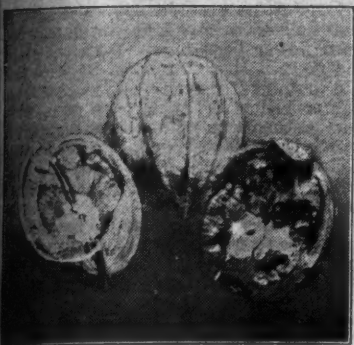
Plant Hickories

For Nuts

By J. F. Jones, Pennsylvania

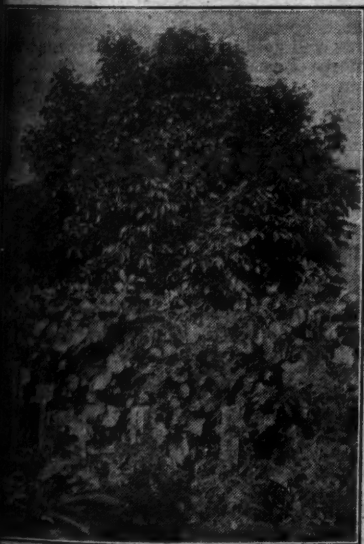
The tree shown in this article is grafted on pecan stock or roots. The pecan has proven to be one of the best, if not the best, stocks for the shagbark and other hickories. The pecan is a strong grower and forces the shagbark faster than it grows naturally on its own roots. Besides their usefulness, there is no more beautiful tree than the shagbark hickory.

The tree illustrated was planted in spring 1908. It was a very small one year tree. The first nuts produced were in the season 1914. Grafting has not proven to hurry the bearing of fruit in the shagbark



Hickory Nuts Before and After Cracking

as much as in most other nuts, notably the pecan and the English and black walnuts. The Weiker shagbark is considered to be one of the finest varieties so far propagated. The original tree, growing in Lancaster County, Pa., is known to be over 200 years old and was left in the clearing of the original forest on land deeded by William Penn. The Weiker has a very good bearing record although it has its off years and produces a good crop only every-other-year. It has a record of 12 bushels in a single crop, but the average crop for the old trees is probably not more than half this amount



Shagbark Hickory on the Grounds of John C. Ruah, West Willow, Pa.

and possibly not over four or five bushels on the average.

The old tree stands on the lawn of Christian LeFever, Lampeter, Lancaster Co., Pa., and is the chief attraction of the lawn. While the shagbark is of slow growth, especially in its early age, the tree is healthy and long lived and always an object of admiration. The nut is equal to the pecan in richness and fine quality, and in this respect is the finest nut grown in the northern states. The varieties being propagated by grafting are the finest yet discovered and are very much superior to the average shagbark in size of nut, thinness of shell and cracking quality, and plump delicious kernel.

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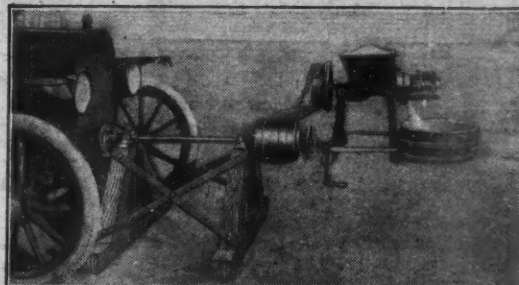
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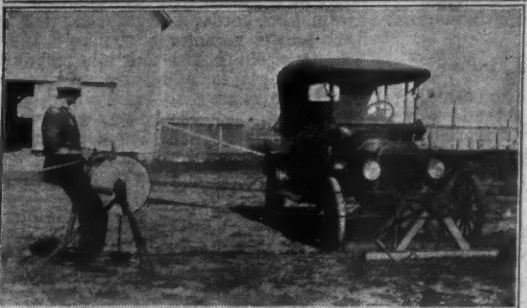
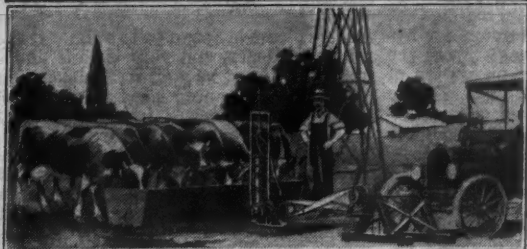
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BEAUTIFYING THE HOME & GROUNDS



By Mary Lee Adams

HEAR the March wind blow! A keen, cold blast. We often wish it wouldn't howl so, and yet those trumpets of the March wind seem always calling for spring. That is what makes March the most hopeful month of all the year. Unless you live far enough south for earliest April to bring cherokee roses, yellow jessamine, wood lilies and violets in all the glades, it is still winter when March comes. But the calendar says it is the first spring month. Let us accept it as such and pretend to look along the streams for pussy willows, and for crocus in the grass. Arbutus and hepatica cannot be far away.

Even if you are shivering, the trees know that spring is on the way, for with the first day of mild sunshine you can note how the buds have swollen. This is the season when "the forests seem to listen for the coming of the leaves," and after the long months of bareness a green leaf is a thing of exceeding beauty to us. A leafy tree is always a wonderful and uplifting sight, but we are so used to it that we may forget to give to trees all the admiration they deserve.

When you think of beautifying your home grounds, think first of trees. If you have them, cherish them. You can hardly realize how bare and hard your place would appear without their softening influence. If you have none, plant some. Cultivate a sentiment for your trees. Poets have always paid them loving tribute. It is a Japanese custom to write verses to some favorite tree, and tie them to its boughs. In cherry blossom season in Japan, many trees are thus decorated. But the tree always has the best of it, for the poem cannot hope to rival its beauty. Joyce Kilmer, who died in France in the great war, has expressed this thought in "The Tree."

I think that I shall never see
A poem lovely as a tree.

A tree whose hungry mouth is prest
Upon the earth's sweet flowing breast.

A tree that looks at God all day
And lifts her leafy arms to pray.

A tree that may in summer wear
A nest of robins in her hair;

Upon whose bosom snow has lain;
Who intimately lives with rain.

Poems are made by fools like me,
But only God can make a tree.

Some city lots are so contracted that one good-sized tree would throw the whole of it into shade and nothing else could be accommodated. How thankful we should be that such conditions are not general in the country. When city people ask me about various drawbacks to the country, only courtesy prevents my overwhelming them with suggestions as to the drawbacks of the city.

Freedom in Country Life

What freedom we have in the country! "Ah, freedom is a noble thing. Freedom all solace to man brings." Freedom of space, of light and air, of individual inclination. The poor dweller in towns cannot be independent even in planning the kind of planting he wants for his grounds. Unless he is selfishly willing to mar the appearance of his street, and thus lower the value of his own and all adjacent properties, he must conform to the planting plan of the whole neighborhood. This is far the best thing to do, because the effect of his own planting would be spoiled if set among inharmonious surroundings.

A whole street that has been planned and planted as a unit, has infinitely greater charm, and even produces an effect of greater variety, than when each lot is a startlingly individual conception. So many landscape disasters have resulted from each city dweller or suburbanite indulging his personal taste, that now in many cities whole communities agree upon a general similarity of planting, and one

professional carries it out for all. He allows the owner, to be sure, a little latitude of choice as to the details, particularly toward the rear of his lot, but nothing like the large liberty of even the most modest country place, whose grounds as a rule run no risk of clashing with others in full view on either side.

Liberty Not License

Yet even the ruralist must curb a too rampant ego, and subordinate his preferences to the good of the general effect, even though the grounds of his own property alone are to be considered. You may dote upon palmettos, blue spruces and sweet peas. Each of these may express, to your taste, the summit of perfection of its kind, but right here you should stop and think whether they would be altogether pleasing in combination.

You say you love flowers and beauty, then why is your taste as a landscape gardener not altogether reliable? We are naturally puzzled when we set out to make a beautiful landscape picture by the use of beautiful specimens, and find the result too disappointing for words. We know that each element of the design was in itself exquisite, and yet look what we produced!

A fine country place in the famous "Land of the Sky," in North Carolina, has been hopelessly ruined by the owner, who was honestly devoted to flowers. The view from the house is superb, the trees were a needed and lovely addition, set mostly to the sides where they did not interfere with the view, and yet in places veiling it to the extent of allowing suggestive glimpses of the far blue mountains rather than an unbroken sweep against the horizon. The opportunities for developing something rare and charming were endless.

Unfortunately a few hardy hydrangea bushes began to flourish exceedingly, and this man was carried away by the showy heads of bloom. He noticed that they were handsomest where the sun struck full upon them. He decided, in his own words, that his "place should become famous for hydrangeas and view." Whack! went the grand old trees. A regular plantation of hardy hydrangeas was set out. Highly fertilized and carefully tended, they developed huge solid heads that looked more like polar bears than flowers. As curiosities they attracted comment, as blossoms they almost offended. The bareness of the hill is deplored by all who knew it when graced by the shade trees. Instead of the place becoming "famous for view and hydrangeas" the owner became famous for bad taste.

Why Mistakes are Made

It is hard to realize that something intrinsically handsome will not add to the effect of the whole but may materially detract from it. This is the mistake most often made by amateurs. We make these errors because our busy lives have not led us to study such questions as proportion, harmony both of form and color, balance and a host of others that enter into the calculations of the trained landscapist.

It is often wise, when possible to do so, to consult with a professional before deciding what to do with our grounds. One has wisely written "Theoretically the trained landscapist knows best, but the determining factor will be the balance struck between the tactfulness of the designer and the obstinacy of the client." The client should by no means be without his own ideas and preferences. He ought to know what he wants, and generally does, but he does not know how to set about getting it. If he will listen to the advice of one whose business it is to understand more than he, himself, can reasonably be expected to know of this subject, he may not have to repent at leisure.

Often observation of the means by which others have secured a desired effect, will be most helpful. So will observation teach you much in learning what to avoid. You

will note that a few unusually striking and beautiful plants, used as an accent against a neutral background, will appear more brilliant than an entire clump of the gorgeous bloom set out in the middle of a bare space. Romeo says of his shining lady love that "her beauty hangs upon the cheek of night, like a rich jewel in an Ethiop's ear." Had there been a large company of Juliets set cheek to cheek in broad daylight, Romeo would have experienced no such exalted sensation.

Two Pictures

Just close your eyes and picture imaginary grounds. Fancy the first, where the owners indeed love flowers but have no knowledge to guide them in how they should be placed. The tranquility of the lawn is disturbed by round beds of raw, red geraniums or other flaming flowers. These might have looked inviting if withdrawn where they would gleam from a dim background. Shrubs are dotted here and there without relation to each other and apparently with the sole object of displaying each twig, leaf and petal. These give no mass of foliage, afford no privacy, help no other shrub to appear to best advantage. Each cries aloud for admiration of its own peculiar merit. This jangle of form and color affects the eyes somewhat as sensitive ears are affected by a jazz band. Though we might cheerfully endure the jazz for a limited period, few would care to go to sleep and get up to its strains. We look at our grounds day after day and they should not weary us.

How different is the well thought-out planting. Here the trees are set where they will give shelter, shade and a sense of retirement, as well as forming a frame for the picture made by the house and grounds. Brilliant and obvious plants are not flung where it is undesirable to lead the eye. The shrubbery will creep close to the foundations of the dwelling, clump itself in needed masses as a screen, or follow with an irregular line of form and color the confines of the smooth, cool lawn. A sense of rest and satisfaction, of space and quietness is attained even within narrow bounds.

The Flower Border

You are doubtless now planning your flower borders, and if you wish to get the most pleasure out of them you have plenty to think of beforehand. If the border is to be a flower planting at the base of shrubbery, it will present a different problem from the border that runs between the turf of the lawn and the path or driveway. In the latter case no background will have to be considered. For a small informal place, a bright effect of pretty bloom is apt to be the aim. If there be no gardener, and your time is limited, perennials must be your main dependence, for the tender annuals need more attention and must be renewed from year to year.

Whether the grounds be extensive or of modest proportions, consider the frame or setting of your planting. Avoid such tints as would conflict with the fixed features of the place. If your house be painted a strong color the flowers near by must tend to subdue rather than to emphasize this. I would not border a bright, red brick path with scarlet geraniums. There is infinite variety of shape, size and hue among the blooming plants, and sufficient choice is offered to more than satisfy all possible conditions. In any case, a few well-chosen varieties will give a better effect than a hodgepotch of many.

If you have a suitable place for making experiments, why not try a special color border? This will need some study but the result will be most gratifying. Suppose you long for the sunny cheer of yellow. Plan for this glowing border a background of flowering shrubs mainly blue and purple. The pure yellow blossoms of the border may be accompanied by some that shade to orange; and here and there a touch of blue (the complement to yellow) will strengthen the glint of gold. You may revel in plenty of yellow tulips, daffodils and crocus sown low among the taller plants.

For the blue border we naturally look for a complementary background of yellow-flowered shrubs, and what a good time you may have picking out these! More roses may appear among the shrubbery here than in the above background, for there are a number of hardy yellow varieties that can be set in with the shrubs proper. Laburnum and forsythia will occur to the minds of all, and, with the aid of a nursery catalogue, you will find that your embarrassment is to decide which of all the

tempting things to choose, rather than where to find what you want. Try a few touches of tender pink and yellow, relieved by a gleam of white, in the azure strip. I envy you the delphiniums which are sure to be a prominent feature of your blue border.

Perhaps your taste runs to red. Well and good, but you have the most difficult of color problems on your hands, for no two reds are alike and many of them will not harmonize. In a predominantly red border, a generous sprinkling of white should be provided, and as for the background of flowering shrubs, there is small choice beyond this obliging and sweet-tempered color which gets along well with anything, however angry in hue. Even in the red border you have a fairly wide selection, for different plants will bloom at different times. Indeed, in all planting plans the matter of a succession of bloom should invariably be thoughtfully considered so that no season, save mid-winter, may find your flower beds bare. With the really red flowers, there may well be some that run to orange, or even a few touches of the lighter yellow tones may be used, while chrysanthemums of coppery shades will enrich the whole. Among the reds come hollyhocks, peonies, poppies, several lilies, phlox, tulips, scarlet salvia, nasturtiums and many more beside.

For the white border a background mainly red serves to throw it into high relief and bring it up to its best. Pink and pale blue in discreet masses will enliven the possibly monotony of the white. A faint touch of yellow, if skillfully introduced, will take its place without becoming too prominent. You will note that in all of the color borders a judicious use of white is advised. Most white flowers have elusive shades of rose, lilac or yellow spread upon their petals. If your color picture is to be perfected, evergreens should be set behind the shrubs. These give a substantial effect to the entire planting not to be obtained otherwise. A touch of mystery heightens interest, and the evergreens will afford opportunity to introduce this element and will add much to the poetic suggestion of the planting.

Choose a corner of your grounds with the idea of developing something of this kind in special color effects. As your enthusiasm grows you may branch out more widely along these lines. If your place be large enough for long and deep borders, you will gain such skill as is necessary to merge one color scheme into another without any definite transition, and some day you may start strolling along a blue border with a friend who will be amazed to find that the finish is red, the change from one to the other having been so gradual as not to attract attention.

Our Landscape Service

You should read again our offer to provide free landscape plans for our subscribers who are interested in beautifying their home grounds. The eager response to this from all parts of the country was very gratifying to us. Furthermore, it convinced us that the American people have definitely made up their minds to make their home grounds beautiful in order to enjoy them to the utmost, and to show that America can be made a country of beautiful homes, not only in the cities and small towns, but in the country districts as well.

We suggest that, if you are interested in having a free landscape plan designed for your property, you should send us a rough sketch of your grounds, showing location of buildings and giving approximate size, as soon as possible, so that there may be time to plant this spring.

Free Planting Plans

To those who would rather have the plan for their home grounds laid out especially for them we have arranged to have plans drawn for any subscriber who requests it. If you have made up your mind you want to beautify your home grounds we would be glad to have you a plan drawn showing exactly where the shrub groups and trees should be planted to get the most artistic effect. The free plan service will insure you of getting a beautiful artistically designed planting for your home grounds or for your local school grounds. If you have made up your mind definitely you want to do something of this kind, we will be glad to have these plans drawn for you. It should always be borne in mind that a landscape planting is an investment—a few dollars put in—beautifying your grounds will add immensely to the sale value of your property if you should ever want to sell it.

The Orchard Home

A Section for Orchard Women and the Children
 Edited by Mary Lee Adams

Your Temper and Your Child's

THERE'S nothing original in the observation that it is rather hard on children to hear "Mama" and sometimes "Papa" dignify their own impatience by the title of "nerves" while the youngster's little irritabilities are called by the plain, but true, name of "bad temper." Most parents are simply observant of their duty when it comes to correcting the child's tempers, but they are sincerely oblivious of their own. To be sure they have, more often than the child has, the excuse of being tired, worried or depressed, and all of these things do, with a high-strung person, tend to a disposition to irritability, which the weary ones, in their own justification, politely set down to "frazzled nerves."

But though the child may not have the same causes for provocation that the parent has, neither has it had the years of experience which should have been devoted to cultivating self-control. It was only a half-laugh we could give when we were told some days ago of a woman who complained that her husband did not at all appreciate the fatigue she must endure as "he had no idea how tiring it was to have to scream at the children all day long." Children who are screamed at from morning to night may well be excused for needing correction. An example of quiet firmness would not only secure the child's more ready obedience, but would establish that respect for grown-ups which they are often blamed for not showing when really nothing has been done by the parents to inspire it. If you happen to be one of those weary women who is tired of "screaming at the children all day long," try the more restful method. As soon as the children learn that your quiet command means just exactly as much as one that is yelled at the top of your voice, they will reward you with improved dispositions, obedience and a far better relationship to yourself.

Education and Success

ALL PARENTS wish the very best for their sons and daughters. All would like to believe that their child is going just a little further than its father and mother have done. If they do so it means progress, if not, it likely means slipping backward, for nothing is stationary. And hasn't life taught you that a large measure of success in life depends upon training and education?

It is not invariably the best educated man or woman who takes a good position in the world, but think of it this way.

Take a group of 500 persons who have known no education beyond that of the ordinary rural grammar school, and another group of 500 who have been through high school and possibly college. Would you doubt for a minute which group has the larger earning capacity? This proves that education is a practical preparation for gaining dollars and cents, not to speak of the many other riches it brings into the life of well educated persons. Yet year by year we allow the future of our children to be imperiled by paying teachers such a low salary that the ablest of them are constantly being drawn away into higher paid jobs, leaving the less efficient to train our children.

To know the risk we are running, we must appreciate how eager other businesses are to secure the best at a good price. Here is a quotation from "American Education" for December. It bears the somewhat misleading title "Teachers wanted." We naturally suppose teachers are wanted for teaching, but read this. "All teachers should try the U. S. Government examinations constantly being held throughout the entire country. Thousands of permanent positions are to be filled at from \$1,100 to \$1,800, have short hours and annual vacations with full pay." The \$1,800 per year looks right attractive to some of our rural teachers. The solution is clear. If we, who are the government, remember, can afford to pay good salaries in any position whatever, we cannot afford not to pay good salaries to those who hold the key to our own children's future.

Homemakers' Resolutions

THIS year of 1919 has been called "Children's Year" for various reasons. Perhaps the most potent factor in calling our attention to the prime importance of doing the best possible for the child, was the great war. With young men dying by the thousands the growing children assumed greater relative importance, as the filling of the gaps was seen to depend upon them. The following resolutions embody the view point of the Missouri Woman's Committee, Council of National Defense, as to what is necessary for the good of the family: Resolved:

1. That I will guard my own health and nerve force in every possible way.
2. That every member of my family, in-

cluding myself, shall have the proper amount of fresh air by day and by night.

3. That I will do my housework in properly ventilated rooms and allow myself at least one hour of outdoor exercise daily.

4. That I will recuperate my physical and nervous strength by lying down at least half an hour each day.

5. That I will conserve my health by sitting down at my work whenever possible.

6. That I will plan for variety and nourishment in a properly balanced diet, and will try to maintain simplicity in house furnishings and dress, as well as in regard to food.

7. That I will place safety first by knowing the source of our ice and milk supply, by demanding good drainage from my house and by fighting flies and mosquitoes.

8. That I will join with my neighbors to combat conditions which imperil the health and hygiene of the individual family and the community.

9. That I will give a little time each day to the study of child life, the care and feeding of infants, the diet for older children, discipline and the formation of good habits.

10. That in January of next year I hope to have better health, a better home and better children because I have lived up to these resolutions.

What Girls Can Do

AN ALABAMA girl has created a homemade "thermos" bottle for keeping liquids warm so that school children may take a hot drink to school. We call the attention of our girl readers to this because we feel it may inspire them to try to do something helpful for their own community. Girls are very apt to think that their mothers and fathers should do all the community work, but one is never too young to begin the noble effort to serve ones fellows. This homemade bottle was so simple that when you read how it was prepared you will wonder you didn't think of it first. A tightly corked bottle placed in an oatmeal carton, some excelsior to stuff between the bottle and the carton, and a few cents' worth of oil-cloth for a cover, did the trick. By this means many children who need the stimulant for a hot drink in the middle of a cold day, are helped to comfort and improved health. The Alabama girl must feel a great sense of satisfaction that she solved a problem that worried many mothers who could not afford the costly thermos bottles of the stores.



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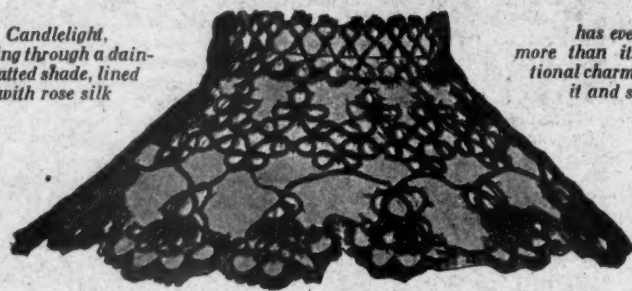
WRITE FOR A FREE BOOKLET

Charlottesville Chamber of Commerce, Charlottesville, Va.

A Variety of Decorative Uses for Tatting

Candlelight, glowing through a dainty tatted shade, lined with rose silk

has even more than its traditional charm. Try it and see



Tatting Abbreviations: Ds, doubles; p, picot; r, ring; ch, chain

TATTING is an old, old form of needlework, but the decorative uses to which it is put, change and grow with the changing styles of handiwork. The articles illustrated here are somewhat elaborate in effect, but in reality are easy for the woman, who is at all familiar with the art of tatting, to make.

A Tatted Collar in Wheel Design

THIS beautiful tatted collar worked in cream or ecru thread will show up particularly well on a dark cloth gown, the effect of the wheels being light and cobwebby. It is made as follows:

Large wheels. 1st r of 12 p with 1 ds between each p. Close. Tie and cut thread.

2d. R 3 ds, join to p of 1st r, 3 ds, close. Leave a length of thread. R 3 ds, p, 3 ds, close. Leave a length of thread.

R 3 ds, join to 2d p of 1st r, 3 ds, close. Repeat until you have 12 small rings. Tie and cut thread.

R 5 ds, p, 3 ds, (p, 1 ds) 3 times, 3 ds, p, 5 ds, close. Leave a length of thread. R 3 ds, join to p of preceding small r, 3 ds, close. Leave a length of thread. R 5 ds, join to last p of preceding large r, 3 ds, (p, 1 ds) 3 times, 3 ds, p, 5 ds, close. Leave a length of thread. R 3 ds, join to small ring as before, 3 ds, close. Continue around wheel. Make 6 large wheels and join as illustrated.

Small wheel. R 12 p with 1 ds between each, close. Tie and cut. R 5 ds, p, 3 ds (p, 1 ds) 3 times, 3 ds, p, 5 ds, close. Leave a length of thread and

8 ds, r 3 ds, join to last p of r, 3 ds (p, 1 ds) 3 times, 3 ds, p, 3 ds, close. Continue till there are 8 rings joined by chains. Tie and cut thread. Join to center two large wheels as illustrated. R 8 ds, p, 5 times, ch 8 ds, p, 8 ds, join to p of r and continue around, joining to small wheels and spool and shuttle wheel as illustrated.

Now make 6 groups of 3s.

R 6 ds, p, 3 ds, p, 3 ds, p, 6 ds, close. Repeat twice, making a clover leaf. Join to work as in the illustration.

With spool and shuttle, r 4 ds, p, 2 ds, (p, 1 ds) 3 times, 2 ds, p, 4 ds, close. Ch of 8 ds and r as preceding. Continue until length of neck and join with the wheels as illustrated. Now, tie thread to r of small wheel near point of front and chain 6 ds (p, 1 ds) 3 times, 4 ds, r 3 ds, p, 2 ds, join to p of clover leaf, 2 ds, p, 3 ds, close. Ch 9 ds, join to p of clover leaf. Ch 2 ds, (p, 1 ds) 3 times, 6 ds. (R 3 ds, p, 2 ds, join to neckband, 2 ds, p, 3 ds, close.) Repeat 3 times.

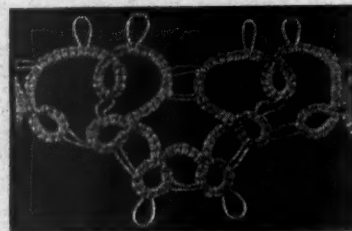
Ch 6 ds, p, 4 ds, r 3 ds, p, 3 ds, join to neckband. Ch 4 ds, r 3 ds, p, 3 ds, close. Ch 4 ds, join to first r of neckband. Finish point with a clover leaf. — Design by Eliza Whitney.

A Candle Shade of Tatting

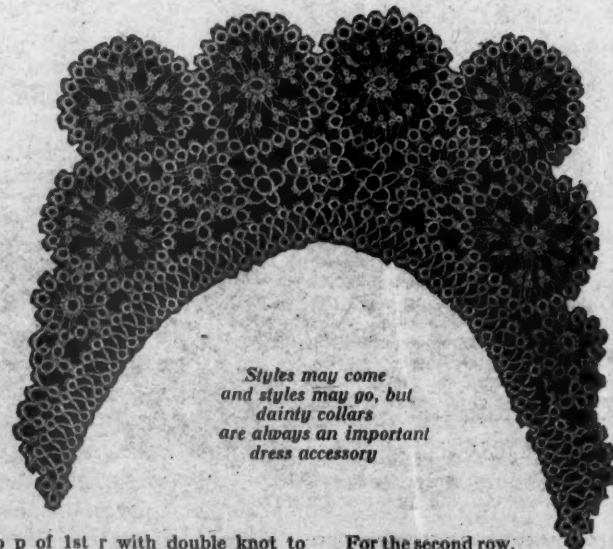
THE materials required are Crochet Cotton

No. 50, red and gold beads.

First Row at top of shade, r three ds (p, 2 ds) 4 times, p, 3 ds, turn, ch 7 ds, r 4 ds, (p, 2 ds) 6 times, p, 4 ds, ch 7, repeat from beginning 25 times, fasten off. By turning this row with smaller r to the top, it will curve to the shade.



Detail of tatted edge suitable for towel trimming



Styles may come and styles may go, but dainty collars are always an important dress accessory

join to p of 1st r with double knot to prevent slipping. Continue all around, when you have 12 r. Make 4 like foregoing and join as illustrated.

With spool and shuttle make r, 3 ds, p, 3 ds, p, (1 ds, p) 3 times, 3 ds, p, 3 ds, close. Chain of 6 ds. (p, 1 ds) 3 times,

For the second row, ch 1, first r: 8 ds, p, 6 ds, p, 4 ds, p, 3 ds, second r: 3 ds, join last p of first r, 4 ds, p, 4 ds, join middle p of r on lower side of row, 4 ds, p, 4 ds, p, 3 ds; third r: 3 ds, join last p of last r, 4 ds, p, 6 ds, p, 8 ds, turn

GROWER

Uses

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join to p ofds) 3 times,
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p. 4 ds, r

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d. Ch 4 ds,

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Eliza White

Shade

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ch 9 ds, r 7 ds, p. 7 ds, turn, r 7 ds,
join last p of last r of ch 1, 7 ds, p. 7 ds, ch 9
ds, make two rings close together, each 7
ds, p. 7 ds, p. 7 ds, turn, ch 9 ds, r 7 ds, join
last p of last single r, 7 ds, p. 7 ds, turn,
r 7 ds, join last p of second r of two rings
close together, 7 ds, p. 7 ds, ch 9 ds.
Repeat from beginning.

For the third row, large r, 10 ds (p. 2 ds)
6 times, p. 10 ds, turn, ch 3 ds, (p. 3 ds)
three times; let this chain lay around large
ring and join by shuttle thread to first p
of large r. Ch 7 ds, r 3 ds, (p. 3 ds) three
times, ch 7 ds, join second p of one r, ch 8,
r 4 ds, (p. 4 ds) three times, join third p of
1 r, ch 8 ds, r 5 ds, (p. 5 ds) three times,
ch 8 ds, join four p of 1 r, ch 8 ds, r 4 ds,
(p. 4 ds) three times; ch 7 ds, join fifth
p of 1 r, ch 7 ds, r 3 ds, (p. 3 ds) three
times, ch 7 ds, join sixth p of 1 r, ch 3 ds,
(p. 3 ds) three times, join at base of one r,
turn, ch 10 ds, join free p of first of two
rings on edge of second row, ch 4 ds, join
p of second of two rings ch 10 ds, repeat all
around, fasten off.

For the fourth row, string 350 beads on
thread, then wind shuttle, pushing beads
along on ball thread so as to leave a con-
tinuous thread between shuttle and ball,
with beads on ball thread, "join to second
p of first r on edge of third row, ch 2 ds,
(move up one bead, leaving small space of
thread as for p, ch 2) five times, join p of
next r, repeat from "three times, ch 2 ds,
(bead p. 2 ds) seven times, repeat from
first " all around.

When shade is completed it should be
stiffened and lined with transparent rose
colored silk, put in plain or slightly shirred.

A Tatted Edge for Towel Ends

Begin with the ring at the end of the
long chain at the top of edging, and make
as follows: Ring 6 ds, p. 6 ds, close.
Chain 3 ds, p. 6 ds, p. 3 ds, p. 6 ds. First
small ring at the lower left hand side of the
group of 4 small rings at lower edge of
trimming: Ring 3 ds, join to p of first
ring, 3 ds, p. 3 ds, p. 3 ds, close. Chain
6 ds. Ring 3 ds, join to last p of last ring,
3 ds, p. 3 ds, p. 3 ds, close. Repeat from
chain 6, making 4 rings in a group. Chain
6, join to last p of first ch, 3 ds, join to next
p of same ch, 6 ds, p. 3 ds. Ring 6 ds,
join to last p of last ring, 6 ds. Chain 3
ds, p. 6 ds, p. 6 ds. Ring 6 ds, join to mid-
dle p of last ring of group of 4 rings, 6 ds,
close. Ring 6 ds, p. 6 ds, close. Chain
6 ds, p. 6 ds, p. 3 ds. Ring 6 ds, p. 6 ds.
Chain 3 ds, p. 6 ds, p. 3 ds, p. 6 ds. Ring
3 ds, join to p of last ring, 3 ds, join to p of
second ring back, 3 ds, p. 3 ds. Chain
6 ds. Repeat from third ring made.—De-
sign by Mrs. Hutton.

CHEAP LANDSCAPING

By Sophie Tunnell, Illinois

Our neighbors were having their yard
beautified by a landscape gardener. He
drew a chart or plan and then proceeded
to set out plants and shrubs. For this he
charged them seventy-five dollars. How
we did envy them, and how we did wish
that we might improve our lawn! We
could have done it very easily, but that
seventy-five dollars was the obstacle. So
we thought and thought and finally we de-
cided to walk around town and study the
other places that had been laid out by land-
scape gardeners. We did this and found a
dozen or more beautiful lawns that we had
never paid especial attention to before.

In all we found that the view directly in
front of the house was left unobstructed,
there was practically nothing planted on
the front lawn. The shrubbery was plant-
ed around the house to hide the founda-
tion, and where there were unsightly
angles, tall shrubs were used to hide them.
Then, at the side, the shrubbery seemed to
connect the house with the lawn and at the
rear it was planted to form a setting or
background for the whole. Along drive-
ways were planted shrubs in irregular
clumps. After having studied this out we
drew a plan of our yard.

Then we decided to go to the woods and
see what we could find in the way of wild
shrubs. We didn't get half way to the
woods for we found clumps of elder grow-
ing all along our pasture fence, this is easy
to be transplanted and will grow almost
anywhere.

We dug all those along the fence and,
as it grows tall, used it for our shrubbery
at the side and in the rear of the house.
The white blossoms of this are beautiful
in the spring, and the purple berries of the
fall are also lovely, besides affording one
much pleasure in watching the birds which

come for the berries, for they feed sixty-
seven different kinds of birds.

Wild Rose and Barberry

Growing in among the clumps of elder
we found the rosa setigera or the wild rose.
This and the elder bloom at the same time
and form one of the most beautiful com-
binations imaginable, the pale pink roses
and the dainty white elder blossoms. We
dug up some of these and planted them
with the elder but alas! they all died. We
have tried time and again to transplant
them but always with the same result.
Once we had a large bush which we thought
was going to live, but after two or three
months it died also.

We next found a small shrub growing
just at the edge of the woods, it was the
wild barberry, sometimes called coral
berry, for it is covered with small red
coral-like berries in the fall. This does
not root very deep and when transplanted
grows like a weed. So we dug up quite a
number of these, which we placed where
small shrubs were needed around our founda-
tion.

Berried Vines and Low Shrubs

On an old fashioned rail fence we noticed
a vine with pale green leaves. We took
some of these and planted them to cover
an ugly chicken yard fence. This was the
ceastrus scandens or the bittersweet vine.
In early fall the red, almost terra cotta
berries are beautiful. And if these are cut
just before the heavy frosts the leaves will
not fall and will remain green all winter,
thus making a bouquet for the house when
there are no flowers to gather.

In the woods are found some wild hy-
drangeas or the hydrangea arborescens, it
has leaves that are shaped like, but smaller
than, the cultivated plant, and a blossom
shading from white to palest green. We
placed clumps of these, for they do not
grow tall, along our driveway.

Ferns and Flowers

Near the hydrangea on the hillside we
found ferns, the maiden hair, the common
sword fern and the large oak leaf fern, also
harebells, wild columbine, wild geraniums,
and blue bells. All these we planted among
the barberry on the north side of the house
close to the foundation, where it is damp
and shady. They have grown wonder-
fully well.

Then one day, along a country road, we
found clumps of the rhus glabra or wild
sumac. This we found very easy to use
as shrubbery, especially the young plants.
It is beautiful in the fall with its brilliantly
colored foliage, and it also is a shrub that
attracts the birds, for forty different kinds
feed on its berries. A little farther down
the road we found a bridge covered with
hop vines, and by the brook that the bridge
spanned, many wild grapevines. These
we took and placed on the fences near our
bittersweet vines.

More Wild Treasures

On a hillside leading from the road we
found a number of the cercis canadensis
or red bud tree. This blossoms in early
spring, and while the branches are closely
covered with small lavender flowers, not a
leaf is to be seen. This was hard to dig
up for it had a top root, but we were finally
able to get a few.

Near these we found a thicket of pyrus
canensis or wild crab. Besides lovely pink
blossoms, it is the most fragrant of all wild
shrubs. Then we found a small tree having
the Indian name of Wahoo, it was sup-
posed by the Indians to possess medicinal
qualities. This does not grow much taller
than four or five feet and has the reddest
of red berries that hang down from its
branches like miniature chinese lanterns.
This with the sassafras officinale or the
common sassafras with its brilliant foliage,
we placed in the background at the rear of
the house. Some of these shrubs if allowed
to grow tall are really trees, but by careful
pruning can be kept low.

When we had procured and set out all
these, our lawn was landscaped, perhaps
not as artistically or as beautifully as
others, but still we are no longer classed
with the "unlandscaped." Our health
has improved, we have learned something
of our native shrubbery, and best of all
we have found the trail that leads to God's
great out-of-doors.

Andy Gump tells us that he crossed a
sugar beet with a milk weed and supplied
his neighbors with cream and sugar for
their coffee.



The HOUSEKEEPERS EXCHANGE

by Edith Randolph

We will pay \$1.00 each for helpful suggestions which will save time, money or strength in all sorts of housework. None save original ideas can be accepted. Unaccepted manuscripts will not be returned unless an addressed, stamped envelope is enclosed. Address "Housekeepers' Exchange," American Fruit Grower, Chicago, Ill.

Feathers for pillows should first be put into slips of strong netting and then into the ordinary ticking slip. This enables the feathers to be easily washed and aired.

M. R. S., New York.

To get the meats of pecans out whole, soak them over night in water. Next morning crack them on end and the meats will come out without breaking.

H. D. R., Virginia.

One of the best substitutes for maple syrup is made by covering twelve to fifteen washed corn cobs, preferably red ones with water and boiling one hour. Strain the liquor, add sugar and boil until syrupy.

R. V. S., Vermont.

To keep cold starch from sticking, rub a little white soap (any kind) in the starch until it suds; then starch as usual.

L. B. M., Maryland.

If your cupboard is damp keep a bowl of quicklime on the shelf. This will keep the air dry but it must be changed occasionally as it deteriorates in power.

C. F. C., Montana.

For leaking refrigerators, either pipes or drip pans, use tough white paper shaped to fit, coated thickly with melted paraffine and applied hot; it hardens instantly and lasts until broken away, yet is cleanly and germ proof.

E. M. F., Oregon.

Soak the dressing out of old window shades, boil them and use them as dish towels, or they can be dyed a dark color to do service in front of the preserve shelf.

G. H., South Dakota.

Use the discarded refrigerator to make the bread rise in the winter. Put the bread on one of the upper shelves and keep a pan of hot water on the bottom shelf. The water must be changed often so that the temperature is kept about the same. You will find the bread will rise to twice its volume and be as light and spongy as the oft envied baker's. The refrigerator will have to be brought into the kitchen or some warm place to make this a success.

A. E. B., Minnesota.

Sprinkle sugar over home-dried fruits for the children's lunch box. It is more healthful than pastry and they like it.

R. M. T., Massachusetts.

Black suede shoes which are rusty in appearance may be restored to their original blackness with lamp black. The adhesive qualities of the lamp black if it is well rubbed in will keep it from coming off on the clothing.

T. J. T., Montana.

Lye sprinkled around a building infested with rats will do away with them; also there is no odor left from the bodies as the lye eats them up.

R. R. W., Idaho.

To increase the amount of boiled frosting add one teaspoon of very cold water to the very cold white of one egg. Beat until stiff then add slowly the syrup made by cooking one scant cup of sugar with $\frac{1}{4}$ cup water until it forms a thread. Beat until stiff. Some people always use whites of two eggs but you do not need to, if you add the cold water to one egg white.

E. S., Michigan.



The Afgco Cook Book

by Beatrice Holmes

All recipes contained in the Afgco Cook Book have been tested and consequently the housewife will be saved any disappointing experiments

Old-Fashioned Meat Pie

1 pint cold boiled rice $\frac{1}{2}$ onion chopped fine
1 pint finely chopped 3 or 4 sprigs parsley
meat (minced)
2 eggs 2 tablespoons butter

Cook onion in butter until golden brown. Add meat and rice mixture. When heated take from fire and add well beaten eggs and parsley. Season with salt and pepper and turn into a baking dish. Pack in close and bake until brown. When almost done put into it several balls of mashed potato dipped in milk. Cover with cracker crumbs and brown. M. B. B., New York.

Hamburg Spaghetti

1 box spaghetti 1 pound hamburger
1 can tomatoes 3 stalks celery (chopped)
2 onions (chopped) 1 green pepper (chopped)
Bacon grease $\frac{1}{2}$ cup grated cheese

Cook spaghetti until tender. Cook tomatoes and onions twenty minutes. Cook hamburger steak, celery and green pepper in bacon grease. Combine and add $\frac{1}{2}$ cup grated cheese. Put in oven to brown well.

R. G., Minnesota.

Currant Muffins

2 cups flour 2 eggs separated
 $\frac{1}{2}$ teaspoon salt 1 cup milk
2 teaspoons baking powder 2 tablespoons melted butter

Mix together flour, salt and baking powder. Beat egg yolks, add milk and butter. Combine and add currants and egg whites beaten stiff. Bake in hot oven twelve to fifteen minutes. P. H. R., New Jersey.

Apple Compote

$1\frac{1}{2}$ cups cooked rice 1 cup water
8 fine flavored apples 2 tablespoons lemon juice
2 cups sugar Strawberry jam

Press rice into a buttered one quart melon mould. Cover mould and reheat in a steamer. Pare and core apples and cook until tender but not broken, in a syrup made of the sugar and water. When tender remove apples, add lemon juice to syrup and continue cooking until thick. Unmould rice, arrange apples around rice, fill cavities with jam and pour the syrup over all. Serve cold or hot.

M. S., Wisconsin.

Jelly Jumbles

$\frac{1}{4}$ cup butter 2 eggs
1 cup sugar 2 cups flour
 $\frac{1}{2}$ teaspoon salt 2 teaspoons baking powder
 $\frac{1}{4}$ cup milk
 $\frac{1}{2}$ teaspoon lemon $\frac{1}{2}$ teaspoon vanilla

Cream butter. Add sugar gradually. Add eggs beaten until thick, sift together flour, salt and baking powder and combine with first mixture alternately with milk. Add flavoring. Turn on floured board, knead slightly and pat or roll to $\frac{1}{4}$ inch thickness. Shape half with a small round cookie cutter and other half with doughnut cutter of same diameter. Place rings on top of cookies, put $\frac{1}{2}$ teaspoon of jelly or jam in hole, press edges together, and bake 20 minutes in moderate oven. Especially nice for the school lunch box.

A. R. C., Delaware.

Designs With Character for Early Spring

Afgco Patterns

How to Order Patterns

Write your name and address plainly on any piece of paper, give number and size of each pattern you want; enclose 12 cents for each number, money order, stamps or coin (wrap coin carefully), and address your order to American Fruit Grower, 329 Plymouth Court, Chicago, Ill. Safe delivery of all patterns is guaranteed.



9151. LADIES' AND MISSES' WAIST—Waist with overblouse having closing on left shoulder and apron front. Sizes, 34 to 44 bust. The 36-inch size requires 2½ yards 36-inch goods, with ¾ yard 36-inch lining, and 6¼ yards binding.

9036. LADIES' AND MISSES' TWO-PIECE SKIRT—Tucked panels gathered at slightly raised waistline. Sizes, 16, 18 years, and 26 to 32 waist. Width at lower edge is 1½ yards. The 26-inch size requires 4½ yards 40 or 44-inch material.

9144. LADIES' AND MISSES' COAT—Collar may be buttoned high or low. Sizes, 16, 18 years, and 36 to 42 bust. The 36-inch size requires 2½ yards 44-inch, or 2¼ yards 54-inch, with ½ yard 36-inch contrasting goods.

9154

9147. LADIES' AND MISSES' DRESS—With convertible collar and two-piece skirt. Sizes, 16, 18 years, and 36, 38, and 40 inches bust measure. The 36-inch size requires 5¼ yards 36-inch material without up and down.

9154. LADIES' AND MISSES' ONE-PIECE DRESS—Plain and plaid taffeta will make this smart dress for early Spring. Sizes, 16, 18 years, and 36 to 42 bust. The 36-inch size requires 1¾ yards plaid material, and 2¼ yards 36-inch plain.

9124. MISSES' OR SMALL WOMEN'S ONE-PIECE SLIP-ON DRESS—The bolero front is attached to the long panel at the back. Sizes, 14 to 20 years. Width at lower edge, 1½ yards. The 16-year size takes 3¾ yards 36-inch dark material, with 1½ yards 36-inch light material, and ½ yard 36-inch lining.



9124

8971

8971. LADIES' SLIP-ON WAIST—With shoulder edges of back extending over front in yoke effect. Sizes, 36 to 42 bust. The 36-inch size requires 2 yards 36-inch material, and ½ yard binding for front.

9151
9036

9149

9144

9149. LADIES' AND MISSES' THREE-PIECE SKIRT—Closing at back and in slightly raised waistline. Sizes, 16, 18 years, and 26, 28, and 30 waist. Width at lower edge, 1½ yards. The 26-inch size requires 1¼ yds. 54-in. material.

9121. GIRLS' DRESS—The tucked vest and long collar of contrasting material make this gingham most attractive. Sizes, 6 to 14 years. The 8-year size requires 2¾ yards 36-inch material, with ¾ yard 22-inch or wider contrasting.

9077. LADIES' DRESS—The two-piece skirt of this dress has gathered panels at each side of front and back. Width at lower edge is 1½ yards. The 36-inch size requires 5¼ yards 36-inch material, with ¼ yard 36-inch contrasting.

9121

9077



Better Housekeeping

by Lillian Ring

Care and Mending of China

CHINA, having risen in value in the last four years and promising, as it does, to retain such prices until the European manufacturers get back to a normal basis which may take some years, is a household necessity whose longevity is well worth considering.

Proper care and cleansing, barring careless nicking of the edges and breakage, primarily determine the length of service to be secured with the decorations kept intact. Hot water or water even moderately strong with alkali soda or the various washing powders with which the market is flooded, are apt to impair decorations and have been known to erase every vestige, especially of gold. Decorations, except the under glazed ones, are put upon china after the process of manufacture is completed, making the decorations and particularly the gilding only a surface adjunct. The china itself is extremely hard due to the ingredients used in its composition and the intense heat used in its firing, but the decorations are of a softer character and so are more susceptible to injury from exterior applications, for these reasons, if its beauty is to be preserved, it must be washed with the greatest of care.

Lukewarm water with the purest of soaps is all that is essential in the cleansing process. Place only a few pieces in the pan at a time, wash quickly and rinse in clear warm water. Dry without delay. Do not allow china to "drip dry;" use a towel. Wash china immediately after using, especially where foods such as gravies, soups, salads or any foods that leave the dishes damp have been served. Don't allow the dishes to stand in water—water soaking or allowing the dishes to remain wet for any length of time has a tendency to soften the ingredients used in the decorations, particularly gold—and the rubbing of the towel under such conditions will do much towards shortening the life of the design. Hot water even with undecorated china is a risk. The heat seems to make the china susceptible to pressure, hence the ofttime breaking to pieces of the piece in the hands of one who is wiping it. Washing china with care will prolong its beauty and durability for many years and should an accident befall it, there is still enough left to make it worth while looking into the ways of mending it.

The Mending of China

This is not a haphazard process—it requires thought and preparation which though simple should be suited to the needs of the particular fracture. Choose a clear day and a bright place—avoid muggy, moist or sticky weather. If it is china or glass to be mended, spread a clean white cloth over a table, set level in a strong light. Nearby have clean towels and a basin of warm water for the hands. Have at hand a box, say a foot deep and two feet square filled to within an inch of the top with clean dry sand, sawdust, wheat, bran or oats with a top sheet of clean cheesecloth a yard square. Keep a kettle of boiling water ready to undo crooked mends, and have thin flat boards or cardboard on which to lay articles when mended. Complete the outfit with wide and narrow tapes for tying, rubber bands, a bit of dry whitening, a dab of soft putty, a cup of turpentine, a bottle of alcohol and plenty of clean, soft white rags. Wash and dry all pieces before starting to mend.

The best cement because of its durability for china and fine stoneware, is pure white lead ground in linseed oil a little thicker than cream. Apply to both broken edges, using the fingers rather than a brush to smear it on, clean the fingers in alcohol or turpentine, fit the broken parts together, fasten with tape, rubber bands or surgical bandage if the break is a bad one, and set away on one of the squares of cardboard or board on a level surface to dry. Let stand a month, and then with a fine file take away the oozed lead from along the seam which you will find hardly visible

and as stout as any other part of the mended article. A crosswise break, such as might come in a plate or platter where binding would be difficult, needs the aid of gravity in the mending—a good chance to use the filled box. Set the larger half exactly upright in the box by pushing it down, break upmost, until it stands solid—the cheesecloth will protect the edge from the packing. After smearing the broken surfaces fit on the smaller piece, press it tight, hold for a minute, then leave standing for twenty-four hours when it will be ready to transfer to a shelf.

Mends are tested by passing a finger along the seam; if either side projects the mend is imperfect. Perfect fitting and holding together is more important than the kind of cement used. Loosen a break set wrong by holding in the steam from the kettle spout, wash clean of cement with alcohol or turpentine and start anew. The least jar at first will set edges askew—for anything that has a rim, tie something around the brim even if it is only deep enough to hold a fine thread. A flaring dish, as a bowl or cup, tied and set in a whole vessel somewhat smaller, will be held automatically together at the break due to the pressing caused by the weight.

Lime and Egg Mixture

To mend the finest white china beat quicklime to a fine powder, having tied it in a net or cheesecloth. Beat egg white until it sticks to the dish and smear both edges with it, dust with powder and press instantly together, holding it for ten minutes and bind. The lime and egg moisture together make a mortar as hard as the china itself, and only long soaking in hot water will cause it to give way. Mend coarse ware such as majolica, porcelain, etc., with egg white and plaster of paris or whitening. Purely ornamental pieces are successfully put together with soft putty which hardens in a few days. Where handles, hands or feet are to be fastened on, a stiff putty inside as a backing to the break is needed. Glass requires transparent cements. Using glass covered with gin and dissolved in the sun; gum arabic covered with boiling water after all colored bits have been thrown out; and white sugar boiled to candy height are all good, cheap cements for such usage. The sugar cement is only good where the fractures are clean. Where building up is required use one of the other two as they are slower cements.

Skill is tested in the building up process. By means of it almost hopeless wrecks may be made quite presentable and good looking. Study the break; begin by putting together the tiniest breaks accurately; let stand until fast. Mend in sections. Then join the sections two at a time. Fit in shattered bits as you go along as far as possible. Fill in the gaps left by bits that have been lost, with plaster wet until stiff, or putty. When it hardens tint it to match the other surface. This is of course for china and earthenware. Glass takes a filling of clear gum or glue softened so it can be moulded and shaped with oiled fingers. This mend will show but it is better than a jagged edge.

SOMEWHERE IN FRANCE

Why is it that from yonder tower
The colonel's lamp is beaming still,
Though it is past the midnight hour
And all's serene over vale and hill?
'Tis not the wisdom of the sages,
Nor army lore his mind enchants—
An earthlier task his time engages—
He's sewing buttons on his pants.

—O. H. F. in Stars and Stripes, France.

Of the 82 students enrolled in the four-year course of journalism at the University of Wisconsin this term, 78 are women, an increase of 50 per cent over last year.

Missionaries to India have started a canning movement among the natives. The products are put up according to the directions put out by the United States Department of Agriculture.



Funny Words of Wee Folks

by Dolly Forsythe

We will pay \$1.00 each for childish sayings accepted by us for publication. The story must never have appeared before in any magazine or paper. Unaccepted letters will not be returned unless an addressed, stamped envelope is inclosed. Address "Childish Sayings," American Fruit Grower, Chicago, Ill.

One Christmas little Mamie noticed where a brown candle had dripped onto the floor. She exclaimed "I don't think as much of Santa Claus as I did, for just look where he spit tobacco juice on the floor."

(Subscriber who sent above, kindly send address.)

"Does the baby talk yet?" asked a friend of the family. "No," replied the baby's disgusted little brother. "The baby doesn't need to talk. All the baby has to do is to yell and it gets everything in the house worth having."

N. P., Delaware.

Some grown people were discussing an acquaintance. "But that man doesn't swear, surely!" said one. A little girl who was listening piped up, "I say he do, 'cause I heard him."

H. E., Illinois.

Little Raymond was so persistently naughty about putting safety pins in his mouth that his mother decided to impress

the danger of this on him and told him of a child who swallowed a safety pin and had to be cut open so they could find it. Imagine her feelings when he said, "Mama, didn't that boy's mother have any other safety pins?"

Mrs. L. M. D., Massachusetts.

Being asked by the Minister whether she had ever been baptized, she replied, (pointing to her arm) "Dr. Oates done it right here jus' three weeks ago."

M. E. McD., West Virginia.

"Willie," said the teacher to her now scholar, pointing to the letters on a chart, this is 'A.'" Then turning the chart quickly over she pointed to the "A" on the other side and asked Willie to name it. He said he didn't know. "Why," said the teacher, "that's 'A' again." Willie looked puzzled. "What gets me," he said, "is how it got around there so quick." W. S. L., Ohio.



Etiquette for All Events

by Raymond McAllister

It is sometimes very difficult for dwellers in rural communities to keep posted on the proper etiquette for various social occasions. Questions on etiquette will be discussed and answered in this column of the American Fruit Grower. If you wish a personal reply, an addressed, stamped envelope must be enclosed. Address, "Etiquette Department," American Fruit Grower, Chicago, Ill.

When there is a guest staying in the house should the hostess try to entertain and be with her every minute?

H. L. B., Rhode Island.

While it is a great mistake to leave a guest too much alone and unprovided with amusement, it is almost worse for her to feel that she cannot get a minute to herself. The guest who is fond of reading may well be left for a time with a good book, while the hostess sees about her daily duties.

My daughter, who has just returned to school after the Christmas holidays, said to me while she was at home, that it was not right for me to leave my spoon in my cup after stirring my coffee, or when passing it for a second cup. Will you please tell me if this is bad manners, or what is the objection?

G. R. H., Wisconsin.

I would not go so far as to call this little error an indication of bad manners, but it is not considered very good form. As for the objection, if we look far enough it will generally be found that conventions, which may appear trifling, are really founded on convenience, or consideration for others. For instance, when you leave your cup with the spoon standing in it, or pass it without laying the spoon in the saucer, it becomes a very easy matter to upset the cup or drop the spoon on the tablecloth, thus embarrassing yourself and others. Good manners almost invariably have their foundation in the desire to save others from embarrassment or annoyance.

There is no mother in our home, she having died when we were small children, and father being a busy man has done for us the best he could, but sometimes I think that had our mother lived we would have

been taught more of the niceties of good manners. In entering a room I have always just gone in without thought of any other persons who might be going in at the same time, but lately I have noticed that when older ladies are present they usually go first. Is this just an accidental occurrence or do the young people stand back on purpose until the older ones enter?

P. F., Utah.

There is no accident in the fact you have noticed. Older persons, particularly ladies, should be given precedence. It is hard on a family of children to have lost the parent who would naturally be the one to pay most attention to these details of good manners, but with your evident desire to do the right thing, there is little danger of your not overcoming this handicap if you will be observant and follow the example of the best mannered among your associates.

Should a letter always be sent to the hostess by the guest who has stayed several days in the house?

R. N., Texas.

By all means the letter should be written. The guest is under obligation for days of hospitality, a note of appreciation is the least return that should be made.

Must a dinner guest arrive precisely at the hour named?

B. O., Missouri.

In the city one should arrive on the stroke, or a very few minutes after. In the country it is better to allow oneself a little leeway even at the risk of arriving a trifle early. The long distance in the country and the likelihood of watches not being exact, makes the danger of keeping others waiting considerable, and this should always be avoided.



DEAR CHILDREN—Last month I promised you a surprise, didn't I? Well, here it is: We are going to make someone sit over a little bit and give us room to study about the bugs, animals and other little creatures which live on our farms.

This is a good month to study such things, too. For Old Mr. Wind is going to come roaring down and whisk the dead leaves off the ground and uncover lots of the most wonderful things. And you and I are going to find out all about them. This month we are going to hunt up Mr. Garden Toad and find where he spent last winter. And what he is going to do for us this summer, in fact, we are going to pry into his private life and see what the good Lord sent him here for. Most all things have a duty to perform and we are going to find out what his is.

Please write and tell me what you have found out that will be of interest to the rest of the AMERICAN FRUIT GROWER Boys and Girls. Write plainly and don't make your letter too long. If you find out anything that is of real interest I will send the two best letters in to Mr. Adams and I am most sure he will print them.

And for those who like puzzles I am sending in three. Guess them and send in your answers. The correct answers will be published in the April issue of the AMERICAN FRUIT GROWER.

Address all letters, Edith L. Ragsdale, AMERICAN FRUIT GROWER, Chicago.

Tangles

No. 1.—I have no eyes, teeth or nose but I have a wide mouth, a big tongue and a loud voice. All the children know me; some love me—some do not—but I am a friend to all. Tell me who I am.

No. 2.—I paused beside a mill, upon a walk, at a little distance, I saw a key. What town was I in?

No. 3.—As the boy came around the bend Avis was eating an apple. What variety was it?

Answers in April.

"PEANUTS"

(A Puppy Tale)

(Book rights reserved)

The first thing that I remember distinctly was a soft nest in which I and my rather numerous brothers and sisters tumbled about. Of course our mother was there, trim, white and silky. She used to sit or lie and watch us as we rolled over one another; she seemed to think we were just a little over average, and I guess we were. Why not? We were pedigreed Spitz pups and no where could a purer line than ours be found.

Sometimes our father came and peeped over the edge of the basket, but, truth to tell, he did not seem to take the interest in us one naturally expects a parent to show. I have thought it was caused, perhaps, by our playfulness. Being used to frolic with our mother we believed we had the same right to catch our father's tail, tweak his ears, and in other ways show our exuberance of spirits. Being a father is a whole lot different to being a mother, let me tell you.

When I was quite young I crept from the basket and commenced investigating the world. It seemed, after I tumbled out, to be a very, very large world. I could look one way and see an orchard in full bloom; another way and a long stretch of pasture land in which a number of strange creatures (which I subsequently learned to be colts) grazed; then, right in front of our home was the big house, with a board walk reaching clear up to the door.

I didn't get very far the first time. In fact, I had hardly got started when Buddy and Sis (the children who live at my home) came running and put me back in the basket. I was pretty mad about that

you may well believe. I had tried so hard to get out and meant to see so much and to think of those children putting me back and spoiling it all! I tried and tried to get out. I lifted up my front feet and reached as high as ever I could but I couldn't make it. Then I cried, just awful!

The next day I did get out. I watched my chance and when my mother was lying asleep I climbed up on her, grabbed the edge of the basket and, plump! down I came, head first on the ground! That was the first time I even suspicioned the ground was hard. I cried a little, because, you see, I had never before been bumped and it frightened me as well as hurt me. I had thought the whole world soft, like my dear mother's silky coat and our warm nest.

Buddy and Sis (for a wonder) were not in sight, so I thought I'd look around a bit. I nosed about and turned over a can of paint and walked in it and of all the nasty, sticky stuff that paint was the limit. (Slang is not nice, but really, sometimes I just have to use it to express myself!) I stood still and watched the paint run out over the floor. After a while a fussy old hen came along with a lot of ducklings. If she had known how sticky that paint was she surely never would have done as she did. Hens seem to be very foolish things anyway. I've noticed that. This hen was no exception. Buddy and Sis had spilt a little of our food near the basket, and, with a great show of feathers and much clucking and calling that old hen invited the ducklings to come and share the feast she had found.

With little quacky noises they ran, as fast as their little legs would allow, right into that paint. In a second there was the most awful rumpus. I stood and watched them a minute then began to bark. That was about the first time that I had tried to bark and it sounded pretty cute to me. I got so interested in watching the ducks that I fairly danced about. As fast as they would pull one foot out of the sticky stuff the other one would sink deeper in. I yelped and danced about in my excitement and the old hen jumped about and clucked.

Finally I reached over as far as I could and caught one of the floundering ducklings by the tail—or I should have said, "the place where the tail would be someday"—and tried to pull it out—not the tail, the duckling. I never thought of anyone getting mad, but mercy! In a minute that old hen had whipped me all over the shed. She flopped me with her wings and pecked and scratched me. I thought sure I was being killed, and, I guess, I would have been if it hadn't been for my beautiful mother. With a leap she was onto that old biddy and with a snarl she chased her away. I was so hurt and bruised that I whimpered, not loudly, but easy little hurt whimpers. My mother came back from chasing the hen and with her soft tongue licked my wounds, then she picked me up and carried me back into the basket. Home had never seemed half so sweet as it did that day, as snuggled down among my kindred I thought over the awfully narrow escape I had had.

However, I got one grain of comfort out of the escapade; when the Master came to the shed and found the ducklings fast in the paint he declared the hen had turned over the can. Of course, I knew better, but who is expected to understand puppy language? Nobody, of course. So, I just never said anything as he picked the ducklings (who were really no worse off for their bath) out of the paint, and mopped it off with a rag.

NOTE—Next month Peanuts will tell you how he helped Buddy and Sis find the little lost pup.

W. Barret Hankins Says—The Home Leads In Peace-Time Progress



WORLD interest at present is centered on the doings of the men around the peace table at Versailles. What they think, say and do will make an important chapter in the history of nations.

The document which they draw up under the title of "The Constitution of the League of Nations," will be one of the remarkable legal instruments of this and all eras. The diplomacy used in its construction, will go down as a classic example of the compromises which far-visioned leaders will champion in order to bring about world unity. What they achieve will be written into the pages of the activities of the people of the earth. But their accomplishments will not be the real test of world progress.

The ideals which they write into the laws of nations, are powerless, unless they are given meaning by application to the fundamental unit of the universe—the home.

Have you stopped to think of it? The housewife in the home however humble, wields a power more far-reaching and subtle than that of the most pretentious potentate at the peace conference. He is making laws. She is moulding conditions and characters, which prove those laws—which test whether or not they shall endure. She holds in the hollow of her hand factors for success or failure of the home, and hence for that of the community, the commonwealth, and the country.

What women did during the war period, was only the beginning of the service they can render to rid this world of future conflicts. President Wilson sums up their contribution to war work in the words: "And what shall we say of the women—of their instant intelligence, quickening every task that they touched, their capacity for organization and co-operation, which gave their action discipline and enhanced the effectiveness of everything they attempted; their aptitude at tasks to which they had never before set their hands; their utter self-sacrifice alike in what they did and in what they gave? Their contribution to the great result is beyond appraisal."

But now there is more than ever need for woman's work. The task before us is unfinished now, as it was when Lincoln delivered his memorable Gettysburg address. His sentences apply today as they did half a century ago. Our boys have fought and some have fallen in freedom's cause. For them shall "we take increased devotion to that cause for which they gave the last full measure of devotion." Woman's vision of home perfection and her efforts to attain that vision, must be the basis of a nation-wide movement to destroy those forces which seek to undermine by anarchy and disorder, the freedom of our institutions.

The home must be the basis of peace progress. The housewife must realize her responsibilities and privileges in the reconstructing of this nation and the world. As she seizes the opportunities for destroying drudgery, lightening labor, and increasing improvements in the home, will the world approach more quickly a higher place of progress.



Test and Approval No. 129

This nation of ours stands industrially, socially, commercially, governmentally, the leader of the world. But its influence is limited or boundless, retarded or progressive, in proportion, as each individual home and housewife, rise to the heights of service which household efficiency makes possible.

Every housewife takes a rightful pride in the possession of a 100% kitchen. Test and Approval No. 129 is a table which helps modernize and standardize kitchen equipment. It is easily kept clean, sanitary and attractive. It improves and adds to the appearance of the kitchen. The porcelain top, besides adding durability, besides its advantages of time, and labor saving, because of the ease with which it is kept clean, has a variety of uses.

Set lunch or breakfast on this table. Its porcelain top makes the use of a tablecloth unnecessary. No trouble to make cookies or pies, when you have this table. Roll out the dough right on the porcelain top.

You can remove hot dishes from the stove to this table without injuring it—it is heat-proof. Waterproof, also.



Test and Approval No. 131

Test and Approval No. 131 saves time and labor in sewing and insures desirable results. It is a rotary sewing machine which uses two spools, doing away with the necessity of winding bobbins. No. 2, shows the two spools, one on top the other where the bobbins would ordinarily be placed. Sewing with this device enables you to use a 200-yard spool of thread in the bobbin space.

With an equal quantity of thread on both spools at the start, the condition of the upper spool always indicates that of the lower. No more guess work as to how long bobbin thread will last—spool annoyance of under thread running out unexpectedly in middle of seam, and need of rethreading machine to fill bobbin. Simple, compact construction, automatic tension. No adjustment necessary, whether material sewed is heavy, medium weight or light. Filmy lace and chiffon and other light weight goods stitched without puckering or marring material. Strong, light, noiseless feed has power to handle large, heavy seams. Automatic stitch regulator, changes length of stitch instantly. Spools easy to remove and replace. Machine readily operated.

NOTE—Anyone desiring information concerning tested and approved articles on this page, will receive same, by writing to W. Barret Hankins, care the AMERICAN FRUIT GROWER, Chicago, Ill.

EDUCATION PAYS THE FARMER

Thomas F. Hunt, in his work on "The Young Farmer: Some Things He Should Know," says that a farm-to-farm canvasser in New York state "discloses the fact that farmers with college training are obtaining higher income from their farms than those whose school days ended with high school." He further observes that "with the farmers under observation the high school education was equivalent to \$6,000 worth of five per cent bonds."

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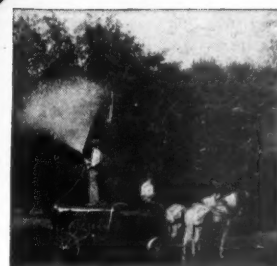
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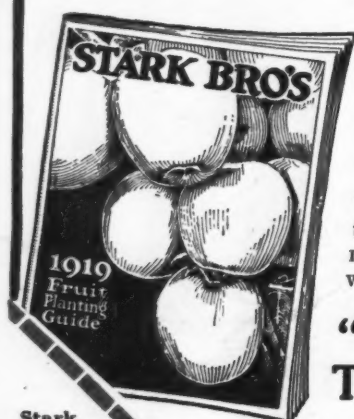
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This is the tree we bought for \$5,000.00. From this tree we have, during the past years, propagated many thousand new Golden Delicious trees. These were tested East, West, North and South. Golden Delicious is now growing in states from the Atlantic to the Pacific—bearing golden crops in the East, Central West and Far West. Last year alone over 10,000 Fruit Growers Planted Golden Delicious Trees.

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"I have eaten Golden Delicious in October and in the spring following and the quality kept well. The Golden Delicious tree, as hardy as Stark Delicious and Wealthy," declares Silas Wilson, owner of the famous 800-acre Wilson Orchards at Nampa, Idaho. "Its faculty for setting an apple for every blossom is most remarkable. Although many apple varieties did not blossom heavy this year the Golden Delicious multiplied 4 to 5 times over last year. And every blossom set an apple!" continues this same practical fruit grower.

Furthermore, it is the youngest bearer we have ever introduced. Also a heavy annual bearer. No other apple tree surpasses it in

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